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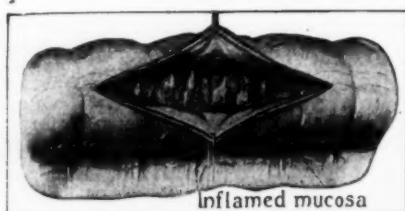
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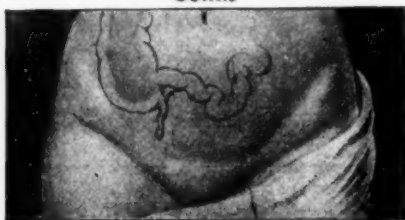
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## Conclusions From One Hundred Cases of Paraffinoma

H. LYONS HUNT, M.D., L.R.C.S., EDIN.

CONSULTING PLASTIC SURGEON, MIDTOWN HOSPITAL,  
New York

It is not curious that a day and age that can produce the hysteria necessary to legislate against the cutting of the plumage of foreign birds, or the thousand and one regulations for the prevention of the suffering of other dumb creatures, can view with apparent equanimity, physical outrages perpetrated against mere humans? But it is curious, that a profession, set apart for its humanitarian principles, takes no decisive step itself in an attempt at legislation, in a matter that should concern it so vitally.

Against such an outrage for example, as the injection of paraffin into the human face, with its attendant serious complications, no voice seems to be raised in even a mild disapproval.

Of course, it may be argued, that the majority of cases of paraffinoma, are the results of experiments, conducted by "beauty doctors," and other such fry; but even this state of affairs, should call for a better enlightenment of the public in general, and still more the enlightenment of those, whose business it is to protect, an unwary public from less disturbing malefactors than the quack specialist in particular.

While I was House Surgeon at the New York Polyclinic, in 1902, I saw several hundred cases of cosmetic deformities *apparently* corrected by the injection of paraffin; it was said that no ill effects followed.

In 1903, through the courtesy of Mr. Cameron, then surgeon in Guy's Hospital, London, a case in which paraffin had been injected under the epithelium of the nose to correct a saddle-back deformity, was shown to me. The injection had taken place the preceding week and the patient had returned to his home, after which a peculiar transposition had occurred. The paraffin had become displaced and was lodged about half an inch above the level of the eyebrows in the center of the forehead, giving the face a grotesque appearance. I assisted Mr. Cameron in the removal of the paraffin, a small mass that occasioned little difficulty.

The results of this paraffinoma, easily remediable though it was, seemed to me bad enough to deter any honest person from injecting paraffin. Though I have never injected paraffin, I have removed, since that time, one hundred paraffinomas.

In a recent reading of one of the new books on war surgery of the face, I was astounded to find that its author recommended the injection of paraffin into the tissues to overcome certain deformities of various sorts. It seems, therefore, not uncalled for to consider the present status of this procedure as it is reflected in recent literature.

As a preliminary statement, it is permissible to say that the injection of paraffin today is seldom practiced by qualified persons. Nearly every authority on surgery condemns its use, not only on account of its liability to produce paraffinoma, but for many other serious reasons. Davis in his work on plastic surgery has enumerated these reasons as follows:

1. Toxic absorption.
2. Marked inflammatory reaction.
3. Loss of tissue, due to infection and abscess formation.
4. Pressure necrosis, caused by hyperinjection.
5. Sloughing of tissue as a result of the heat of the material injected.
6. Sloughing due to injection into very dense or inelastic structures, or where scar tissue is firmly attached to the underlying and adjacent parts.
7. Sub-injection of too small an amount of paraffin with an insufficient correction of the deformity.
8. Hyperinjection with over-correction of deformity.
9. Air embolism.
10. Paraffin embolism.
11. Primary diffusion or extension of paraffin (when first introduced) into adjacent normal structures.
12. Interference with muscular action of the part.



Bilateral naso-labial Paraffinoma.  
Previous to operation.

Bilateral naso-labial paraffinoma.  
Paraffin has been removed on  
right side.

13. Escape of paraffin after the withdrawal of the needle.
14. Solidification of the paraffin in the needle, which renders the injection difficult and causes injudicious expedition on the part of the operator.
15. Absorption or disintegration of the paraffin.
16. The difficulty of procuring paraffin at the proper melting point.
17. Hypersensitiveness of the skin over the injected area.
18. Redness of the skin over the injected area.
19. Secondary diffusion of the injected mass.
20. Hyperplasia of the connective tissue following the organization of the injected mass.
21. A yellow appearance and thickening of the skin after organization of the injected mass.
22. The breaking of tissue and a resulting abscess due to the presence of the injected mass upon the adjacent tissue after the injection has become organized.

Two cases of paraffinoma in women have been reported<sup>1</sup> (1906), where the paraffin was injected into the face by "beauty doctors." In the first case, there were several unsightly lumps on the face and neck, which were firm, hard on pressure, adherent to the overlying skin, and deeply embedded in the underlying tissue.

In the second case, the paraffin which had been injected at the angles of the mouth and had formed firm elongated, yellowish-red, glistening masses, protruding above the surface and resembling keloids in gross appearance. The masses were removed by free incision and examined microscopically; they showed several large cavernous spaces near the center, surrounded by numerous small cavities. The tissue resembled that of a granuloma in general appearance, and was much like that of an early acute tuberculous lesion, with small groups of giant cells, before caseation has taken place. Some of the smaller cavities were partially filled with a fibrinous-like deposit. A high-power microscope showed the mass to be made up of cellular elements grouped in alveolar forms by means of loose areolar tissue; there was also inflammatory infiltration. The cavernous spaces were surrounded with a thick infiltrating wall of leucocytes; areas of large, deeply stained, conglomerate cells suggested the possibility of malignant change.

In 1908, the same author reported the case of a woman in whom he had injected paraffin in 1904 for the cosmetic correction of chicken-pox scars; in 1907, the scars had again become almost as marked

as at the beginning; they were considerably pigmented, and surrounded by a small zone showing mild inflammatory reaction. Some of the larger and more prominent lesions were excised. Histological examination showed the same picture that had been found in the two earlier cases. This time deposits of paraffin were found in the larger spaces; giant cells were numerous and intensified the resemblance to tuberculosis. Heidingsfeld also records a case that he saw in consultation with another physician, in which the injection of paraffin for nasal deformity had caused loss of vision in the right eye.

Sehrt<sup>2</sup> (1907) reported the case of a woman who had been given paraffin injections in the cheek for cosmetic purposes; the injections had been made about a year prior to the time of examination. The soft parts of the cheek had sunk downward and become surrounded by lumps. The removed tissue showed a decided areolar network, some of the vacuoles containing paraffin; the lining of these vacuoles consisted chiefly of epitheloid cells, with some giant cells, and often extended into the paraffin masses; around these epitheloid cell linings was connective tissue. These infiltrating cell masses were filled with droplets of fat, and in some of the paraffin infiltrations the cellular structure had disappeared, leaving homogeneous bands of fat.

A case of paraffinoma in a patient who had had facial injections of paraffin, made by an "unqualified person," is reported by Williams.<sup>3</sup> After several months, tumors developed where the paraffin had become diffused, and a persistent edema accompanied the tumors. Histological examination of the excised tissue showed well formed fibrous tissue enclosing masses of cells, mostly of the epitheloid type, with large numbers of giant cells. These cellular masses and the fibrous tissue were infiltrated between the underlying muscle fibers of the facial muscles.

Razemon<sup>4</sup> reports the case of a boy who had had paraffin injected for a nasal deformity due to fracture, in whose face swelling was said to have occurred soon after the injection. I saw this case three years later; the swelling then showed a reddish discoloration, which became purple in hot weather, or when the patient entered a warm room. The boy stated that the swelling had increased in size but very little, if at all, since it was first observed. The mass, which was adherent to the skin, was removed, and histological examination showed the vacuolar struc-



Paraffinoma of entire face. The paraffin was injected by an unqualified person into patient when she was sixteen years of age.

Bilateral Paraffinoma of face showing the dragging effect on angles of mouth.



ture noted by others, with connective tissue infiltrated at certain points near the vacuoles with epitheloid cells; no giant cells were found.



Paraffinoma of nose.

In an article published in 1909, Beck<sup>8</sup> states that he had used paraffin injections in about 40 cases, and had never had any complication, except "with the rarest exception of a marked local reaction for a brief period, or a suppuration." On two occasions he removed, without difficulty, paraffin which he had injected three to five months before. He reports one case in which a nurse had injected paraffin subcutaneously into her own face, in the forehead, lower eyelids, cheek and neck. Within a few weeks, the regions injected became red and tender; six months later there were several large masses on the face, with a particularly large mass in the parotid region of the left side; all of these masses were reddened, and the overlying skin was traversed with small capillaries. One of the masses in the neck was removed, and the histological examination showed principally fat vacuoles and connective tissue, with few inflammatory cells. In an article published in 1911, he says that in one of his cases a paraffinoma developed about ten years after an injection of paraffin made for the correction of a nasal deformity. He has also observed two other cases of paraffinoma following paraffin injections made for cosmetic purposes by "charlatans." He has abandoned the use of paraffin, and states that it has been very generally condemned by oto-laryngologists on account of complications resulting from its use.

Graupner<sup>9</sup> reports the case of a woman who had paraffin injected for a scar on the forehead just above the nose; the injection was made in 1906, and in 1910, the patient came to his clinic for removal of a tumor that had developed at the site of injection. The tumor area had been painful, and the skin above the tumor was reddened and somewhat tender. When removed the tumor showed two small lumps of paraffin and smaller pieces scattered through the tissues. The tumor consisted mostly of connective tissue, with vacuoles, but there was some cellular infiltration around and between the vacuoles; the base of the tumor consisted chiefly of epitheloid cells—fibroblasts—with some giant cells.

In 1910, Koch<sup>7</sup> injected paraffin into the breasts; within a year the breasts became painful, and swellings appeared at the sites of injection; the skin finally broke down at several of these points, and there was a slow continuous discharge of pus and small pieces of paraffin. I saw this woman in 1916; the breasts were then very hard with a bluish dis-

coloration; the skin was broken down and discharging at certain points, and at other points there were numerous scars. A radical operation was performed, both breasts being removed. Microscopic examination showed no large masses of paraffin, but small particles were scattered through the tissues; there were numerous clear spaces, the tissues between showing either fibrous or inflammatory changes. In the inflammatory areas there was either round cell infiltration or typical granuloma formation. A similar breast tumor, resulting from the injection of paraffin, is reported by Morestin.

Paraffinoma removed in a case operated by MacKenzie is reported by Wingrave.<sup>6</sup> The patient was a young man who had been given paraffin injections ten years before for a nasal deformity. The "lump" that developed gave rise to a feeling of cold, especially in winter; the removal had been attempted before, and finally, MacKenzie succeeded in removing the greater part of the paraffin-fibrous tissue. Histologically, it was found that the paraffin had penetrated between muscle fibers and areolar tissue; the muscle fibers were compressed and distorted; the tracts and spaces were all lined with endothelium, the cells being massed at certain points in a way suggested malignancy; some of the cells were of the type of "young giant" cells with one or more nuclei. Most of the cells were mononuclear; some had undergone fibroblastic change.

Three cases in which paraffin injections were made to correct nasal defects are reported by Eitner.<sup>9</sup> The injections caused swelling, discoloration, and occasional pain; these symptoms beginning from two to eight years later. In the histological description of the excised tumors, he records the presence of connective tissue, with clear spaces and round cell infiltration, and some giant cells.

At a meeting of the Manhattan Dermatological Society, held February 10th, 1920, a woman was presented showing large tumors of the face that had been treated as sarcoid. The patient had been treated by a unqualified person several years before. Dr. Kingsbury's<sup>10</sup> diagnosis of paraffinoma was concurred in by Dr. Mac Kee who considered that the



Paraffinoma of neck.

location and the appearance of the tumors indicated paraffinoma. At times, this patient showed marked edema, which Kingsbury attributed to the inflamma-

tory changes produced by the foreign substance; malignancy might occur in paraffinoma, but he did not regard this case as malignant. In the course of the discussion, Dr. Wise stated that a similar case had been observed about fifteen years previously at the Post Graduate Hospital; sarcoma developed later and the patient died. Dr. Gilmour reported a case seen several years ago at the Roosevelt Hospital in a boy who had paraffin injected for depressed cheeks. He presented the appearance of having a marble in each cheek; the masses were hard and rolled about under the finger like a marble. An attempt was made to remove the paraffin through an incision on the inside of the mouth; the mass was not solid but came out like "rice" grains. The boy's condition was improved by this procedure.

Bevan<sup>11</sup> reports the development of a paraffinoma involving the nose and left eyelid, produced by injection of paraffin to correct nasal deformity in a man, and he describes the subsequent operation on the eyelid for the removal of the paraffinoma tissue. He also reports a case that he had seen several years earlier in consultation with Hyde and Ormsby. In this case, paraffin had been injected in a woman's face, under the eyes and elsewhere, for the purpose of removing wrinkles; several months later paraffinomas developed wherever the injections had been made. Very bright red lines had appeared between the eyebrow, under the eyelids, and on the side of the face. Since that time, Bevan has seen several other women presenting much the same picture, and in some of these, the area involved was so large that he considered operation impossible. He has also seen several cases in men where the paraffinoma was limited to such an area that it could be entirely removed by free dissection. Paraffinomas, Bevan believes, do not follow every injection of paraffin into the tissues, but it is impossible to ascertain in what proportion they occur.

Davis<sup>12</sup> defines paraffinoma as "a chronic inflammatory process involving skin and adjacent subcutaneous tissues, characterized clinically by the development of reddish purple, indurated masses, painless, not tender, persistent, not subject to ulceration, as a rule, and ordinarily benign." Disfigurement results, and occasionally malignant degeneration results. Histologically, paraffinoma shows numerous clear spaces, circular or oval, surrounded by fibro blasts with "marked sprinkling" of endothelial and plasma cells; frequently these clear spaces are the seat of plasmodial masses of endothelial giant cells resembling foreign body giant cells.

This author reports the case of a woman in whom the sites of injections became slightly swollen, indurated and dusky red in color, about a year after the injection of paraffin by an unqualified person. The induration and discoloration spread gradually to involve the greater part of each cheek. At frequent intervals, slight suppuration occurred with extrusion of small particles of what appeared to be paraffin; this would leave small ulcers which would heal and subsequently break down. The treatment in this case was complete excision of the tissue involved, one side at a time, and the substitution of a flap of skin and fat from the arm. The result was very satisfactory.

It has been found that men engaged in handling crude paraffin, in the process of paraffin manufacture, showed chronic inflammatory reactions in certain cases in which there was an individual susceptibility. He concludes that just as crude paraffin may cause

such reactions in susceptible individuals, so the higher grades of paraffin injected into, or beneath the skin, appear to exert a similar influence on the tissues with which they come in contact. Most people into whose skin paraffin is injected do not develop paraffinoma so he believes there must be an individual hypersusceptibility or predisposition on the part of the patient. However, such lesions occur frequently enough "to clothe the procedure of paraffin injection with distinct risk" (Davis).

Lecarpentier-Duboscq<sup>13</sup> claims that injections of paraffin and oils into patients with latent infections, especially tuberculosis, are likely to produce sarcoid tumors; in such cases, he believes, the infection has either rendered the tissues more susceptible to irritation by a foreign substance, or a localization of the infection is added to the irritation. He reports four cases, in three of which tumors followed the injection of camphorated oil, and in one after an injection of paraffin at the base of the nose, done for cosmetic purposes. In the last case, a sarcoid tumor developed at the base of the nose, and near this, but distinctly separated from it was another tumor of the same type. There was a history in this case of tuberculous pleurisy, and the cutaneous tuberculin reaction was positive.

Paraffin injections may have a certain place in some few cases<sup>14</sup> (Oppenheimer), but so many untoward results have been observed that the method may well be condemned in toto. Among the untoward effects this writer includes toxic absorption or intoxication after paraffin injections; inflammatory reactions of marked degree; loss of tissue from sloughing; pressure necrosis; air embolism and paraffin embolism; primary diffusion or extension of paraffin into other tissues; leakage of paraffin after injection; paraffin absorption and disintegration; dermal hyperemia and hypersensitiveness, and breaking down of tissues with abscess formation.

The experimental work recently reported by Weidman and Jeffries<sup>15</sup> concerns the use of paraffin oil as a vehicle in subcutaneous or intramuscular injections, and not its use for cosmetic purposes. They found that in monkeys paraffin oil will produce tumors at the site of injection by causing a foreign body granuloma; these tumors may undergo metastases toward lymph nodes or extend distally, and they have essentially the same histological characteristics as paraffinomas. This tumor formation is not dependent upon the technique of injection, but apparently on individual predisposition. In the introduction to their report of this experimental work, these authors refer to the use of paraffin for cosmetic purposes. They say that, "the employment of paraffin as a cosmetic agent will depend on how much of a gambler the physician as well as the patient is." For, obviously, since tumors develop in only a small percentage of cases, often only after many months, and since surgeons cannot follow up every patient whom they do treat, the surgeon will be able to dogmatize only after he has treated many indeed, say some scores of cases." Their own observations in these experiments, led them to conclude that the tissue reaction in any form of paraffin injection is that of a non-specific foreign body, and that, "it will finally be shown that the introduction of any foreign body will be followed by an order of tumor reaction, provided the person's tissues are thus disposed; and that this will take place regardless of whether the inert body is pure hard paraffin, soft paraffin, celloidin, or cellulose."

(Continued on page 164)

# Gonorrhea

## Its Essential Features and Methods of Control\*

WINFIELD SCOTT PUGH, M.D.  
New York.

For many years in the United States the mere mention of the word venereal was usually enough to create consternation far and wide among the Puritans and other well meaning citizens. Fortunately the veil of hypocrisy has been lifted slowly from this subject and has proved most helpful.

A long experience in the handling of venereal problems has brought home to me the difficulties surrounding the presentation of such a subject. We must all realize that we are no longer children and to accomplish results we must let people know what we are really talking about, in common parlance call a spade a spade.

In the first place what do we mean by venereal disease? This phrase covers those diseases which are usually spread or transmitted while the male and female are engaged in sexual intercourse, by close contact of the genital organs.

The most important venereal conditions are gonorrhea, syphilis and chancroid.

What is gonorrhea? This disease, variously known as a dose, clap, tripper, a strain, etc. is an acute, infectious, highly transmissible disease which attacks primarily the urethral mucous membrane of the male and the urethral and vaginal mucous membranes of the female. It is caused by the gonococcus.

### History

History tells us that a most respectable antiquity is given gonorrhea by the fifteenth chapter of Leviticus. Some claim that it did not appear until 1546, but it has certainly (if the latter date is correct) made up for any lost time.

What is the period of incubation, or the time elapsing between the actual infection and the appearance of the disease, in a recognizable form? This is usually given as from three to fourteen days, but we find the majority appearing in about six.

### The Organism

The causative factor of gonorrhea, is quite conclusively proven to be the gonococcus discovered by Neisser in 1879. It is generally spoken of as a small roll or biscuit shaped organism found within the pus cell in gonorrhea and sometimes outside of it as well. Its other important characteristics are that it does not grow on the ordinary culture media, but grows best on blood containing preparations.

It is not transmissible to animals, takes the ordinary aniline dyes, but is negative to the gram stain. To this we might add that the gonococcus ferments glucose and perhaps maltose, but no other sugars.

### Identification of the Gonococcus

The recognition of this organism is usually very easy. A smear, not too thick, is made on a glass slide. The slide is dried and fixed in the flame, then stained for a minute or so with Loeffler's methylene blue. This stains the gonococcus a distinct blue and as a rule suffices for ordinary purposes. Following this, if thought advisable, the gram stain may be used. It is, however, rare to find any gonococci with the gram (and it is really loss of time to use it) if nothing suggestive has been found with the simple methylene blue.

\*A lecture given at the St. Marks Hospital Training School for Nurses, Jan. 9, 1924.

Just a few words regarding the gram method of staining.

1. The slide is made, dried and fixed by heat.
2. Specimen is covered with one of the aniline gentian or carbol gentian violet preparations for a minute or two.
3. Excess of stain is then poured off and the slide dried between filter papers.
4. Blood specimen with a solution (Gram's sol.) consisting of 1 part of iodine, 2 parts KI and 300 parts of aquadest, for about two minutes.
5. Then with absolute alcohol.
6. Wash off with water.
7. Stain for 2 or 3 minutes with Bismarck Brown.
8. Dry and examine with 1/12 oil immersion lens.

This stains the gonococcus brown, while the organisms that resemble it ordinarily will be black.

In its invasion of the human body, that portion covered with mucous membrane appears to be particularly susceptible to the onslaught of the gonococcus. This is markedly so with those mucous surfaces well provided with glandular structure, as the urethra. The gonococcus very occasionally attacks the skin. In 1910 I reported three or four cases of gonorrheal skin manifestations and these are among the comparatively few in the literature.

### Pathology

When the gonococci are planted on these areas, they produce an irritation of the mucous membrane, and attempt to bury themselves beneath the epithelium. In this they usually succeed in the course of forty-eight hours. They then enter the numerous gland ducts, which they obstruct. Following this there is a gradual extension with much swelling of the mucous membrane and the submucous areas, and the appearance of a purulent discharge on the surface. The disease may be limited to a particular area or it may involve the entire genito urinary tract of the male or female.

### Symptoms

In the male we usually have first a burning sensation on voiding of the urine which is usually quite severe. This is quickly followed by the appearance of a very thick yellowish white, sometimes greenish white discharge of pus. Associated with this, painful erections appear which at times are most distressing. The acute symptoms usually last for a week or so and then gradually subside. The pain on urination is now not so marked but the discharge still persists and no one can say when it will end.

In the female the patient will complain of a profuse vaginal discharge, with difficulty and burning on urination; pain on walking and sitting with a sense of fullness or weight in the groins. Further examination will usually reveal a marked inflammatory condition of the vaginal mucous membrane and a discharge coming down from above. Often even when the external urethra orifice does not show severe signs of infection; by running the finger up in the vagina toward the base of the bladder and then milking down the urethra, a drop of pus will often appear at its orifice. A very frequent early sign of female gonorrhea, is a swelling of the gland of Bartholin situated close to the lower border of the



vulvo-vaginal outlet. This latter is the analogue of the gland of Cowper in the male.

Gonorrheal vulvo-vaginitis in the female and urethritis in the male are so common that one is always justified in looking with suspicion on any discharge from these organs. When discharge or other signs of inflammatory action are present smears should certainly always be made. The possibilities of gonorrheal infection in some one of its manifestations is so great, that rubber gloves, should always be worn in making any vaginal examination.

The complications of gonorrhea may be appalling. The more I see of the disease the more I feel that there is really a distinct systemic involvement in this condition, with the urethra or the vulvo-vaginal tracts as a local manifestation. The systemic signs are often not striking but if we look for them we will usually find evidence in abundance.

The chief local complications in the male are balanitis, balanoposthitis, penitis, lymphangitis, cowperitis, epididymitis, prostatitis and stricture of the urethra. Extending further it may involve the bladder, ureters, kidneys and even beyond this arthritis may occur. Numerous cases of gonorrheal endocarditis and meningitis have also been recorded.

In the female the disease may invade the uterus, tubes, ovaries and even the peritoneum and in the urinary tract the bladder and kidneys may be involved.

One of the most distressing complications of gonorrhea is the involvement of the eye. In view of the common occurrence of gonorrhea, (estimated as attacking anywhere from 60 to 80% of young men) why does gonococcus infection of the eye not take place oftener?

This is due to the fact that the conjunctiva mucous membrane is not well supplied with glands in which the organism can hide itself and develop. For this we should give due thanks as many organisms are certainly carried to the eye by careless individuals, or by other unfortunates who have used their towels, or other articles. It certainly behooves us to use extreme care in the use of towels and toilet articles the property of others.

A similar condition to gonorrheal ophthalmia often occurs in the eyes of the new born, where infection occurs while the child is passing through the infected birth canal of the mother. Shortly after birth the lids are swollen, edematous and exude pus; this we call ophthalmia neonatorum. Modern midwifery prevents this by instilling in the child's eye a drop or so of one of the silver nitrate preparations.

Does gonorrhea involve any other external parts of the body? Unnatural sexual acts have produced gonorrhea of the mouth, rectum and other orifices. I have heard of gonococcus abscess between the breasts and in the axilla, but have never seen them recorded. Gonorrhea of the rectum is by no means rare, and may be produced by contact with vaginal discharge, or that from the urethra. The most common cause however is rectal intercourse. The parts present a swollen appearance, and a terribly foul discharge incident to its contamination by the colon bacillus.

The bane of the pediatric ward, is the vaginitis of little children. This infection is highly transmissible and when once appearing, spreads like wildfire, and will often infect every female child in the ward. The symptoms are redness and swelling of the vulva, with a muco-purulent discharge, containing the gonococcus. The origin of these conditions is often dif-

ficult or impossible to trace. We oftentimes find these conditions in a home, both parents being negative for the gonococcus.

The sequelae of gonorrhea are so many and varied that I shall simply mention the more important. It has been estimated that 60% of blindness (at least) is due to the gonococcus. At least 75% of all the abdominal operations in women are said to be caused primarily by the Neisser infection: this estimate I am sure is conservative. How does it happen? This is the sequence, vaginitis, cervicitis, involvement of the uterus and then into the fallopian tubes, producing what is commonly known as pus tubes. Pelvic abscess is also frequent. This often means not only complete sterility, but the loss of both tubes, ovaries and sometimes the uterus by hysterectomy. Practically all of the real sterility in both sexes can be ascribed to the gonococcus.

#### Modes of Infection

Primarily all cases of gonorrhea in the adult are acquired in sexual intercourse. Other means are said to be possible but they are highly improbable. There is no other class of patients where attempts to deceive the physician as to its origin are as common as in this disease. This is undoubtedly to be accounted for by the hypocrisy which enshrouds all matters concerned with sex. Among the excuses given are that one has strained themselves, or wearing the underwear of another person thought to be afflicted. The use of a common toilet, the organisms supposedly having been left on the seat. Even the bath tub has been accused, and so on ad infinitum.

The fact that the gonococcus resists drying but feebly, pretty well rules out most of the classical excuses. Many of the reasons given for a gonococcus infection, require a most wonderful imagination. Predisposing causes of course do exist, such as abnormal developments, epispadias and hypospadias in the male, and large labial folds and rugae in the female.

#### The Treatment of Gonorrhea

This may be divided into the active and the prophylactic treatments.

In the active treatment the chief factor is rest, the use of acroflavine or the silver preparations locally, in various strengths, in the male urinary antiseptics. In the female we rather rely on the use of antiseptic douches of permanganate of potassium, lysol, argyrol, etc. and tampons of mercurochrome and the silver preparations. Active treatment is such a large subject that I merely mention it in passing.

Preventive measures are by far the more important in any discussion of this sort. We are told by various professional persons that there is but one way to prevent gonorrhea or other venereal disease, and that is by continence, in other words avoidance of sexual relations. While this may be possible with some, (as there are cases of frigidity) with the vast majority it is not possible. True all may not resort to normal sexual intercourse as masturbation or some form of sexual perversion may take its place. There is no better application of the old saying, "practice what you preach," than in relation to venery, where really very few carry out this sage advice. One often hears from well meaning folks that those who cannot remain continent, should marry as early as possible. This is very effectually prevented by modern economic conditions and in addition puppy love is seldom lasting.

(Concluded on page 166)



## Cancer's Cause and Correction

### Some Further Observations

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*In the June MEDICAL TIMES observations were made as to origin and treatment of malignancy which are here continued: the subject being protozoic origin of cancer and use of systemic parasitocides as the remedial measure.*

In all matters pertaining to the remedy of disease final judgment of efficiency rests with the rank and file of the medical profession. Actual tests under the varying conditions of private practice, provide the chief means whereby additions to armamentarium become scientific fixture.

Let us then recount certain features in the history of cancer investigation. We find research has centered upon four possibly causative factors—(1) embryonal origin, (2) nutritional cause, (3) irritation, and (4) germ origin. To dismiss the first is rational. Cells of a perviously normal body do not run mad without some exciting cause. Nutrition has so much to do with every variation from normal health as to designate it an accessory rather than causative factor.

Mechanical irritation calls for more attention because of more definite relationship. Such conditions as epithelioma of the lip and the scrotal affections of British chimney-sweeps, long ago excited the deep interest of certain classes of investigators. In consequence soot contact and consequent coal tar cause for malignancy had its devotees. The part played by filth in such cases is of course remindful of conditions confronted by Bumstead and Taylor in that long-ago research on syphilis which established that chancroid or filth chancre was very different from the chancre of syphilis. This subject of cleanliness will be dealt with later in connection with uterine cancer. Future research will no doubt prove that irritation per se as an excitant to malignancy bears relationship similar only to nutritional factor. Irritation from degenerative conditions caused by so called pre-cancerous growths or surgical interference need not be dwelt upon at length at present.

The fourth bent of research, germ cause, has been largely directed towards discovery of a bacterial origin and through fifty years of active microscopic work bacteria have practically monopolized the field of study while their companion invaders of the human organism, the protozoa, have been considered almost totally in relation to tropical disease.

A much belated interest in protozoology is now being evidenced among some of our most profound workers. Revelations are in order which can very well upset some present well established medical beliefs. This impetus to protozoic research is among the most hopeful situations in modern medicine.

One can imagine that if unusual cancrum oris, rarely evident as it is in mouth and pudenda following measles and other acute infections, was more common; fixture of its protozoic origin would probably follow with reasonable promptitude. But its encroachment is not insidious as with cancer and its quick virulent course and fatal termination, if the disease was more common, would probably incite that desperation of attention which proves most efficient in stimulating investigation.

This reference to noma is not made with idea of associating it with our subject of cancer in the pres-

ent writing though personal observation has demonstrated similarity beyond characteristic of infection without contagion.

Generations of observation have taught us the non-infectious nature of cancer as demonstrated by the immunity of those brought most closely in contact—physicians, nurses and private family members upon whom last care so frequently devolves. Hereditary predisposition also plays but little part, if actuarial consideration by life insurance experts is true index. That such matters are pertinent to protozoic origin of malignancy may be perceived.

In a previous chapter I announced trichomonas as a definite exciting cause of malignant growth. The fact that it is a supposedly benign organism existing with frequency in the upper part of the small intestine and the vagina, and found in the blood, urine, mouth and other parts of the human organism under conditions of health, does not stamp trichomonas as infallibly benign any more than the unfailing benignity of bacillus coli communis is established by existence in a benign state contradistinct from its pathologic activities.

Long ago it was determined to my full satisfaction that malignancies had common cause, that cause being protozoic. Inasmuch as a type of medication, achieved only after much experimental work, has borne out original working hypotheses, fullest confidence exists that perfection and concentration of the remedial agents employed will place professional weapon at our command which will bring malignancy satisfyingly within our control.

I accuse T. of being the malefactor with which we have to deal: the active irritant presence which accounts for old theories of "cell madness" and which causes the tumor characteristic of the disease.

As I have said this presence is merely an exhibition of cell proliferation in the form of barrier growth, wherein the body employs connective tissue, epithelial and other cells native to the site of the disease for defense against a foe of more than usual ferocity.

It is easy to understand that natural barrier of multiplying cell construction should result. As in a pustular presence the processes of phagocytosis are set to work, in cancer other cell soldiers are employed. In this light there is nothing mysterious in succeeding tumor creation any more than there is in final breaking down of that tumor when declining physical resistance allows successful attack by the commoner bacteria of suppuration.

We must not overlook the specific blood lust of these protozoa as demonstrated in culture experiment, their tendency even in benign existence to wander and cluster in way characteristic of "cancer cells" in metastases, the demonstrated absence of their favorite food globulin in the cells of cancer tissue, and other pertinent facts. And it is to be noted that cancers unlike other diseased conditions arising from bacterial origin do not create an anti-cancerous antibody which may be supportive of a protozoic rather than bacterial cause.

Among known protozoa trichomonas is a distinct entity. The fact that protozoologists have designated it by differing names according to site of presence is quite immaterial, as are the slight variations in form in which it appears.

Generally described trichomonas is a unicellular, mononuclear pear-shaped organism possessed of three or more flagellae at its larger end, and an axostyle upon its under surface which probably provides means of fixation for feeding. The parasite has remarkable motility.

It is to be noted that trichomonas differs from the majority of protozoa in not existing in a cyst state while dormant outside the human organism. This cyst state, protecting other protozoa against death in acid environment, is not a needed protector for *T.* however as our subject protozoa is a common enough presence in the vagina with its acid secretions, and discovery in the urine shows its disregard for acid media and differentiates its habit strongly from some other forms of amoebic life. *T.* is facultative.

In trichomonas we have as definite a parasitic entity, though of microscopic size, as surface condition affords in pediculus. Such simile is justified by scientific fact and affords easy public understanding which the profession is learning is a good thing to have on one's side.

The common body louse, pediculus, is visible to the naked eye and lives *upon* the body. Trichomonas is microscopic and lives *within* the body. One is as much of a louse as the other and while it would be neither pretty or professional to describe removal of parasitic cause of cancer as a process of de-lousing; that, devoid of mystifying verbiage, is just about what treatment must consist of.

The conquest of malignancy resolves itself into discovery of means of sufficient potency to kill an invading parasitic presence without harmfulness to normal tissue or normal life function. In direct ratio with potency of present means and stage of disease existing, do we get results.

Manifestly, objective can only be accomplished by systemic medication. We must reach the locale or locales of the multiplying parasitic presence through the everywhere-reaching avenues of the circulatory system and we must supply the blood current with a parasiticide, specific for its purpose but innocuous to all normal life processes.

The use of the combination of camphor, eucalyptol and creosote designated as AO has these necessary requisites. Continued increase in its potency which will be surely resultant from pharmacal research now in process, will advance us much further on our path of conquest.

For use precedent to surgical interference this treatment possesses a virtue which may be promptly recognized. Its action of circumscription is certainly along line of rendering a removable mass removable with less hazard of non-completeness of operation and a period of prior application should produce a lessening to metastatic tendency which has significant bearing.

There is nothing of a contra-indicatory nature in the medication which prevents the use of radium, or Roentgen or ultra-violet rays. Such measures in chosen cases may well assist in the development of gratifying result. I have at times used these latter accessories but wish to make it plain that confirmation of the values of the medication has been with-

out these accessory aids and in spite of their usefulness there has been no fogging of exact cause of results through combinations of treatment which might leave specific value in doubt.

There exists in humans a much greater immunity against the poisonous effect of phenols than is possessed by the lower animals. In effort to overcome that common disease, mange, well recognized in the lower animals, the use of phenols has often been accompanied by destruction of the animal itself; this because canines and felines have not yet acquired the resistance to phenols which has been acquired by humans. Much more susceptible are the protozoa.

Consequently if it becomes possible to saturate the human with phenols given in the immune form AO presents, protozoic life within a human habitat has little chance for continued being if strength desired has been achieved. The progressively increased strength obtained under conditions admitting of perfect safety of administration has brought me to point of these announcements and in the devout hope that broader investigation with more minds at work will bring us finally to the sought for goal of cancer's elimination, even in those farther advanced stages which present means do not permit us to cope with.

Experimental medicine in effort at artificial cancer creation is prone to confuse results from mechanical irritation with specificness of cause and call the two one. That would be quite all right if there could be left out of account the continuous presence in the subjects of those protozoa which some investigators calmly cut out of the picture as benign and which are here accused of being the real causative factor in malignancy.

I have seen in the practice of others several cases where intracellular injection of coal tar derivatives applied in non-isotonic form resulted in a sloughing process most resistant to healing. Such cases afford striking illustration of tissue havoc created by mechanical irritant presence persisting long after any contained element of medication had been absorbed and passed from the scene.

It is well established that malignant growths do not create any immunizing bodies that protect the system against them. This may be regarded as significant of protozoic as against bacterial origin. Whether, as an eminent surgeon was recently quoted, cancer is caused not by the germ but the poison produced by it, may be subject for debate.

In this connection with trichomonas as cause, let us again consider external parasitic action. Take cimex lectularis, the common bedbug. Human blood is its favorite food and it not only feeds upon its victim by puncture but injects an irritant secretion into the wound to continue the blood flow. *T.*, possessing similar function, might well add impetus to barrier construction by such process. Regardless of that interesting question however it is apparent that unless barrier erection resulting in tumor growth did follow, multiplication of *T.* would cause earlier invasion of surrounding tissue and consequent hastening of fatal termination—a picture more in line with the progress of cancer oris.

Previous reference to uncleanness as predisposing cause to malignancy had reference to prevalence of carcinoma of the cervix uteri. It is known that *T.* is a rather constant denizen of the vagina, disappearing after the menses, like enough following food supply, and soon resuming residency. This resumption of tenancy is probably via the perineum. Doubtless the favorite home port of the invader is the upper part of the small intes-

tine just as filarius chooses the receptaculum. Its presence elsewhere is a tribute to its motility and wandering habit.

Even where great personal cleanliness is practiced by the female, the method of vaginal douching employed and ingredients used may result in very imperfect cleansing. Douches in position of relaxed recumbency are rare, yet they alone under usual home facilities produce thoroughness of result. Bichloride solutions are inefficient in comparison with boracic acid and that in comparison with phenols for certain antiseptic purpose.

Such imperfection of cleansing might in part account for the rapidly growing inroads of cervical cancer and is a thought on prophylaxis well worthy of the doctor's attention. We must also note an alarming spread of this particular manifestation of malignancy among virgin womanhood as is too well confirmed by its increasing frequency among members of celibate sisterhoods.

Reference to diet in cancer may be confined to those simples which most physician students recognize. It is doubtless more than coincidence that the uric acid diathesis is associated with cancer predisposition.

Vegetarians and orthodox Jews seem less disposed to the disease than others. Certainly these classes live upon better balanced diets, safer from excess acid production, than the majority of us. The trend of conservative thought is leading more and more to belief that slow acidosis, result of modern diet habit, certainly makes our degenerative years more susceptible to those diseases most apparent after the age of forty-five.

To attribute chronic acidosis or other result of faulty living as direct cause of malignancy is not in keeping with best judgment. Insofar as such conditions weaken physical resistance and correspondingly increase vulnerability we must consider diet as a factor to be recognized in establishment of general regime in for patient welfare.

Meat, fish, eggs and cereals are all acid forming, though cereals are but slightly so. Per contra milk, vegetables and fruits are strong in their preponderancy of base elements, hence these latter should constitute bulk of diet as largely as will not interfere with the patient's physical and mental well being. The body's esprit de corps is so dependent upon mental poise, and so easily reduced when the psychic factor is disturbed by unusual, distasteful or uncomfortable rationing that the doctor must of his own intimate knowledge choose the lesser of two evils.

For reader interest there are hereto appended a few case records. These are made with brevity as it is proposed in a further article to go into case records in greater detail.

S. R. male aet 53. Confirmed diagnosis of gastric carcinoma by attending physician. All symptoms characteristic of malignancy. Eighteen months history of illness. Regurgitation of food, coffee-ground appearance. Slight pupillary jaundice. Considerable loss of weight past three months. Physical examination showed palpable tumor somewhat lower than usual pyloric extremity of stomach. Growth two to three inches transversely four inches from above downward. Much stomach flatus with eructations, foul in odor.

Daily injection, five minims increased to ten, showed perceptible improvement in first three weeks with marked alleviation of preceding discomfort; at end of eight weeks such marked improvement as to excite great optimism. The treatment covered a total period of 18 months, at which time the case was discharged. Treatment during last half of period was desultory. Tumorous mass had disappeared. Digestive function to all appearance natural.

After seven years this patient has had no recurrence and digestion continues normal as he performs uninterruptedly his daily work as engineer on a steam road-roller.

J. C. male, aet 49. Previous history marked cephalalgia. First diagnosed as sinus trouble. X-ray, Dr D. New York, showed striking enlargement in region of sella turcica. Diag-

nosed tumor. Continued rapid growth in next 12 months confirmed malignancy. Wasserman tests repeatedly made always negative. X-ray by B. A., St. Louis, one year after first x-ray showed greatly increased size. Patient recommended to Boston for surgery. Operation not permitted, Dr S. and Dr. C. strongly opposing on ground of sure fatality.

Subjected to injection treatment for one year, slow progress at first, pronounced improvement after six weeks and continued slow but progressive yielding in size of tumor with corresponding diminution of brain pressure symptoms, ending with complete disappearance. Treatment was continued for two years, later treatment being desultory.

After four further years of observation patient at age of 55 is in excellent physical condition and free from all symptoms of his former invalidism.

H. P. male, aet 57. Epithelioma of the face involving ear and mastoid region, induration extending to forehead and cheek. Ulcerated region three inches long by two inches across, destruction of the ear drum, great pain, hemorrhage and purulent discharge. Previous hospital treatment for two years with radium and x-ray, with no apparent relief, in fact surface lesion had increased from size of half dollar to above.

Under injection over seven months' period ulceration surface was decreased in size to that of thumb nail. Case passed from observation at this time. At last observation the skin of the previously effected area had returned to normal, the hairs appearing in usual relation to normal skin.

R. K. female, aet 50. Referred as inoperable cancer of the rectum. Bacteriological examination confirmed my diagnosis of amebic dysentery, though no history of residence in tropical climate. My diagnosis confirmed by Dr. J. Awaiting confirmation of diagnosis a fifteen days' saturation by injection was employed. After laboratory findings, case was advised of non-malignancy. Treatment for type of protozoic invasion, actually causative of condition, resulted in restoration to health.

A. D. female, aet 64. Extensive carcinoma of the breast involving axillary region. Total ulcerated surface size of dinner plate and extremely offensive in discharge. No encouragement given, but under insistence of family physician injection treatment was begun with result that after three days there was almost complete cessation of odor and great diminution in discharge. For first treatment had to be assisted to office. After seven daily treatments by injection she walked of her own initiative from place of residence seven blocks to St. Patrick's Cathedral, attended mass and returned. After three further treatments case returned to family physician in Pennsylvania, who continued the treatment several weeks after reporting progress as 'almost too good to be true.'

Case remained in apparent stasis for six months, ultimately dying of a pneumonia quite dissociated from the malignancy. This case is presented as a palliative exhibition where condition seemed almost moribund in beginning.

S. A. female, aet 59. Tumor right breast. Ulceration size of silver dollar, hard and immovably attached to rib. Seven weeks' treatment by injection was followed by such decided improvement the patient returned to home physician and he continued injection with excellent results, he reporting six months later that she had resumed her school work and was apparently on the way to full recovery.

K. S. female, aet 47. Case came from family physician with diagnosis of gastric carcinoma, confirmed by x-ray. Picture showed tumor presence upper center, causing organ to have saddle-bag appearance. Food retention almost impossible. Great loss of weight, aversion to food and great abdominal flatus attendant with constipation and inordinate desire for fluids.

Treatment via mouth and intracellular injection produced remarkable relief within two weeks. At writing case has been under daily treatment for seven weeks. Prognosis distinctly favorable. Former gastric symptoms almost entirely absent, marked gain in physical appearance and extraordinarily rapid diminution in size of tumorous mass under palpation.

12 Fifth Ave.

#### Vincent's Infection of the Mouth

I. Hirschfeld of New York recommends this treatment. At the first sitting all necrotic material is removed as lightly as possible, either by picking it off with cotton pliers, or, preferably, by wiping it off with a tapering swab of cotton, on the end of toothpick, saturated with a 10 per cent solution of Neosalvarsan in glycerine. The patient is asked to obtain, immediately upon leaving the office, an original 1 pound package of sodium perborate with which to make a solution, one teaspoonful to three quarters of a glass of tepid water, to be used every half hour until otherwise instructed, rinsing the mouth thoroughly with the entire contents each time, and forcing it through between the teeth. Where systematic disturbances are manifest, the patient is advised to take a saline cathartic at once.—(N. Y. Med. Jour., Aug. 1, 1923.)



## Treatment of Syphilis at the U. S. Public Health Service Hospital No. 70

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The first injection of arsphenamin was given in this clinic on March 3rd, 1921. Since then and up to October 1st, 1923, six thousand two hundred and fifty-one injections have been administered to one thousand and ninety-five patients.

While we have had our difficult cases, some twenty-five mild nitritoid reactions, three cases in which silver arsphenamin seemed to agree better than 606 and one case of mercurial dermatitis (due to intramuscular injection), we have been so fortunate as to have had no deaths and no serious complications, due to treatment, of any description.

Some of our immunity to serious or fatal complications must be ascribed to the class of patients treated. They are all sailors. The necessities of their calling require that they be of a more or less rugged constitution, while the regular and open air life at sea renders them more resistant to depressing influences of disease, dissipation or treatment when ashore.

To arrive at any reliable conclusion as to the serological results of treatment, a much more exhaustive and thorough analysis of the cases would be required than the scope of this report permits. Clinically the results have been all that could be desired; while a cursory examination of the records shows about 70 per cent negative Wassermann reactions taken six weeks after the last injection.

If increase in attendance is any indication of success of treatment, three hundred and eighteen injections of arsphenamin given in July, 1923, as compared with forty-nine given in July, 1921, would seem to indicate that the patients have benefited in a way satisfactory to themselves.

A follow-up system has been devised; but when it is recalled that after receiving a course of treatment the patients almost invariably go to sea at once, possibly never to return to this port, the difficulties of keeping continuous reliable records can better be imagined than described.

For the same reason we are unable to come to any scientific conclusion as to the minimum number of injections required for the average case. Our dosage has been arrived at empirically, through the experience of the profession at large and by a system of increasing from a small to a larger dose; with a tendency to increase the frequency of the treatment rather than to markedly increase the total amount of arsphenamin.

We believe that the successful treatment of our cases should be based upon keeping them saturated with arsenic and mercury for a definite period, as far as can be safely done. Casual or intermittent treatment, we consider worse than useless.

It seems to have been fairly well established, that the spirochaeta pallida can by degrees develop resistance to any dose of arsphenamin that can be safely given to a patient. If we wish to develop resistance to a drug in man, we would give it in small doses at long or irregular intervals. If we wish to develop resistance to arsenic in the spiro-

chaeta, a similar method would be logical. Give a patient an initial dose in New York, ten or fifteen days later another dose in Galveston, in another ten or more days a dose in Panama, etc.

Can a better method be devised to make the patient arsenic fast? The analogy may not be perfect, but it is sufficiently close. The psychological aspect is also worthy of careful consideration. If the patients get the idea that so many "shots" are necessary and that they can get them anywhere, sooner or later they will get the impression that they can take them at any time. Many of them seem to have some such idea as this; one injection cures them of a fraction of the disease and that each succeeding injection relieves them of a corresponding fraction. Anything that tends to confirm them in this error is, we believe, a grave mistake. We are therefore of the opinion that every patient should be urged to take the necessary time off to complete at least one full course at any Public Health Clinic that may be most convenient for him. He should be made to understand, by the way the treatment is given, that the surgeon who treats him from beginning to end of the course will take more interest in his case than three or four surgeons scattered all over the country. The patients will be quick enough to appreciate this personal element, and a more consistent attendance and better results will ensue. Of course, acute infectious cases must be treated promptly wherever they may find themselves; but even these, when obliged to quit after two or three injections, should be urged to take a full course in one place as soon as they possibly can.

Most of the cases of relapsing syphilides that we have (and this seems to be the universal experience) are in patients that have been insufficiently treated.

It is no argument that in the Army and Navy a syphilitic register is found useful. Here the patients are under absolute control and are seldom so situated that they cannot have the care of an Army or Navy surgeon at short notice. Such is not the case in the Public Health Service. Every case in this clinic goes through the following routine:—A preliminary history and examination is made in each suspected case. The first consists of a few questions as to a sore, past or present, previous Wassermann tests and previous treatments. The second consists of an inspection of a sore, if one exists, and a glance at the skin of chest and abdomen, or at any skin lesion the patient himself may complain of. Blood is then drawn for the Wassermann test. If there is a sore on penis, or active lesions elsewhere, a dark-field examination is made, either at once or on the following day after dressing with normal saline. Any necessary temporary treatment is prescribed at this time. The diagnosis is made from a positive dark-field, a positive Wassermann, unmistakable clinical evidences of syphilis, or any combination of these observations or facts. A chancre with enlarged epitrochlea glands and pronounced roseola, with or without a positive dark-field, is considered sufficient evi-



dence to put a man on treatment without waiting for the report on the blood. Up to the present time the diagnosis in such cases has always been confirmed by the blood report, except in the case of a positive dark-field, when we consider ourselves and the patient fortunate if the Wassermann reaction is still negative.

The diagnosis having been made, a more careful history and examination is recorded. We try to find out what previous illness the patient has suffered from, paying special attention to gonorrhea, sores on penis, previous Wassermann tests, and previous treatment for syphilis.

It is our opinion that urethral chancre is much more common than is generally believed. Several cases of so-called gonorrhea have come here for treatment which have proved to be suffering from urethral chancre, either by dark-field examination or the prompt appearance of early secondaries and a positive Wassermann reaction. Therefore, when a patient admits one or more attacks of gonorrhea but is unable to recall anything like a chancre (genital or extra-genital) and whose Wassermann test is positive, or who shows unmistakable evidences of secondary or tertiary syphilis, we strongly suspect a urethral chancre, either pure or complicated with G. C., as having been the initial lesion.

The present history we date from appearance of the infecting sore as far as we are able to determine it. The period of incubation is in many cases impossible to estimate, on account of the frequency of exposure up to the discovery of the sore and, I regret to say, sometimes afterwards. The character and duration of the sore is now gone into and the patients are questioned as to the appearance of eruptions and any other symptoms they may have noticed. It is remarkable how few symptoms, other than the initial sore, the patients notice or complain of in the early cases. The roseola and early secondary symptoms usually escape their observation; also, few complain of headaches, pains in the bones or other general symptoms.

A physical examination is now made.

The patients are invariably stripped to the knees and completely when necessary. Were this not done, many interesting skin lesions would escape observation, the patients being ignorant of them. A record is made of the condition of the pupils, deep reflexes, and the presence or absence of a Romberg symptom. The glands are next examined. We have been struck with the fact that when the epitrochleae are palpable, the left is larger in a great majority of cases. We have no explanation to offer, simply giving it as the result of our observations.

The mucous membranes are examined, never omitting that about the anus. Again we have been struck with the comparative rarity of condylomata and mucous patches in our cases. The skin is under inspection during the whole examination and any lesions are carefully noted. We have seen all of the more common secondary eruptions and many of the rare ones. Tertiary skin lesions are the exception in this clinic. With the increase in the number of cases we have given up routine urinalysis and eye ground examinations, unless the nature of the case requires. Few cases have been hospitalized. Our experience is that the patients almost invariably improve in every way as soon as treatment is begun. The diagnosis having been established, the patient is at once given an injection into the buttock of approximately one grain of salicylate of mercury. He is also cautioned as to the contagiousness of open

lesions, if he has any, and given both verbal and typewritten instructions as to further treatment. Our freedom from Herxheimer reactions we ascribe to this initial dose of mercury. No patient in this clinic is ever given arsphenamin without it, except, of course, in the case of provocative injections.

Like everything else, this simple little operation may be well done or poorly done and, except by accident, it is not one that any fool can do well. This, the patients will appreciate more than the surgeon. Injections into the fat are followed by persistent lumps and irregular and unreliable absorption. The internal pudic artery, after it has left the pelvis, may be wounded with very unpleasant results. The injection may be given into a vein with resulting emboli in the lung,—a disturbing accident to all concerned, but not a necessarily fatal one by any means.

We use a 10 per cent suspension of mercury salicylate in almond oil and of this one-half (0.5) a c. c. is injected.

There are several well known points of election for the site of the injections, one of which we use. It is situated midway on a line joining the top of the internatal fold and the anterior superior spine of the ilium on either side. Surrounding this point is an area about the size of a silver half dollar within which the injection may be given with safety. A 2 c. c. syringe is preferred. The needle should be three inches long over all, and about 18 gauge. The injection is usually given standing with the patient resting his hands upon a table. The wire should not be removed from the needle until the last minute. The needle without the syringe attached, held at right angles to the surface, with a steady motion, is plunged into the skin and enters the muscles. To be sure that the point is in the muscle, it may be made to touch the bone, withdrawn about a quarter of an inch, and then left in place. The patient is asked if he feels any pain. Ordinarily there is none, except in neurotic cases. If he complains of sharp and shooting pain, a terminal nerve has been wounded; the needle must be withdrawn and reinserted about a quarter of an inch to one side.

The syringe should now be filled. If there is any bleeding through the needle, it must be withdrawn and reinserted in the same manner as when there is pain. There being no blood and no pain, the syringe and needle are connected and the injection is given gently and slowly. Without detaching the syringe, the needle is withdrawn with a quick movement and gentle deep massage is employed for a few moments.

Given in this way, subsequent pain and discomfort will be reduced to a minimum and the dangers will be entirely avoided. In spite of every care, however, some of the patients will complain of discomfort the following day, but most of them will apparently not be affected at all.

After the first injection of mercury the patient is instructed verbally and in writing, as follows:—

"Report for further treatment on Monday, Wednesday and Friday evening at 7 o'clock. On Monday and Friday morning take a dose of salts, eat usual meal at twelve o'clock and nothing afterwards until the following morning. Drink all the water you wish. On Wednesday eat your regular meals."

This is probably excessive precaution, as far as eating is concerned, nevertheless it impresses upon them the danger of a full stomach and they evidently follow it sufficiently closely, for we have never had vomiting on the table or shortly after the injection.

The first injection of arsphenamin is given on the Monday or Friday following the initial injection of mercury. Thereafter the patient receives arsphenamin twice a week and mercury once a week for four weeks.

#### Preparation of the Arsphenamin:

Nothing is more important than the preparation of the arsphenamin solution. No care, no patience, no accuracy is too great. Without the constant exercise of such qualities, no operator can hope to have to his credit a long series of injections without fatal or serious reactions. As a general proposition, I do not believe that the preparation should be entrusted to any one but a graduate physician or pharmacist.

Various preparations of arsphenamin are on the market. The instructions of the manufacturer should always be rigorously followed.

We prepare our arsphenamin solution very much as though we were preparing for an abdominal operation. All glass ware and rubber tubing are thoroughly boiled. The surgeon who does the mixing wears a sterile gown, sterile gloves, and works at a sterile table. Each piece of apparatus is taken by him from the sterilizer tray, rinsed out with sterile distilled water and placed upon the table. The arsphenamin tubes, the labels previously removed by soaking in cold water, are placed in a sterile tray and covered with alcohol. The covering of the tubes with alcohol serves two purposes. It sterilizes the surfaces of the tubes on which heat cannot be safely used. It also acts as an indicator for small invisible fissures, through which it would quickly pass, moistening the contents of the tube and giving unmistakable evidences of a crack. Any tube that shows any crack or evidence of one should be rejected without an instant's hesitation.

The contents should be in a fine powder, or possibly finely granular, the color a light canary yellow. It should pass freely from one end of the tube to the other without the slightest caking. In turning the tube about, the particles may so jam as to hold some of the powder in one end. A gentle flick of the finger should dislodge it and a perfect powder fall to the lower end. Therefore, if there be even any apparent lumps that cannot be broken up into a perfect powder by a gentle shake, or if there is a distinct darkening or change of color in the powder, the tube should be rejected. Some tubes show in places a foggy appearance on the internal wall. This seems to be due to crystallization and appears to be of no consequence.

The apparatus required will vary in size and number according to the number of tubes to be prepared.

There should be:—a glass stoppered container of at least 120 c. c. capacity; a glass funnel and burette with a metal stand for these; two 500 c. c. Erlenmeyer flasks; and one or more gravity flasks regularly used for arsphenamin injections. There should also be sufficient good rubber tubing, metal connections for joining the tube to the needle, metal clips for the tubing, a three-cornered file, sodium hydroxide solution, alcohol, and a number of Fordyce needles.

The best tubing for the purpose is of pure black rubber, one quarter inch external diameter. This, when new, should always be boiled for an hour in moderately strong bicarbonate of soda solution and then in clear water. If this is not done we are liable to have what is known as "tube reaction" for the first few injections. The length of the tubing should be no longer than the extreme spread of the operator's arms, rather a little less. The reason for this will appear later. One end of the tubing is connected

permanently to the gravity flask and the other end to the metal connection for the needle. The rubber tubing can be cut about the center and a short piece of glass tubing inserted, if desired.

Some preparations of arsphenamin dissolve better if put in a dry container and water poured on top. We find it more convenient to put half the required water in the glass stoppered container and then scatter the contents of the ampule or ampules opened with the file, over the surface of the water. We then replace the stopper and shake vigorously until the powder is completely dissolved. We believe that 10 ampules of 0.6 grams each is the largest number that should be used in making up a batch of arsphenamin. For this a glass stoppered cylinder of from 1200 to 1500 c. c. capacity is necessary.

There is a slight negative pressure in the ampule which causes a pop to be heard when it is opened. This slight noise gives additional assurance that there has been no crack in the glass. As soon as the powder is dissolved, the sodium hydroxide solution is added from the burette.

Different manufacturers recommend different strengths of sodium hydroxide. We use a 4 per cent solution. After the solution is clear, filter the solution through several layers of sterile gauze into the empty Erlenmeyer flask, add through the filter the remaining water bringing the proportion up to 120 c. c. to 0.6 grams of arsphenamin, stopper lightly with sterile gauze, and the solution is ready for use.

Our solution of sodium hydroxide is made in two quart batches and kept in a paraffin lined bottle, carefully stoppered. From this, a smaller bottle, also paraffin lined, is filled from time to time as needed. Before filling the gravity flask with the arsphenamin solution, care should be exercised to get rid of any bubbles that may form in the tube. A small quantity of sterile distilled water, enough to fill the tube and a little over, is poured into the container. Then, grasping the bottom of the container in one hand and the extreme end of the tube in the other, the container is elevated until water flows from the end of the tube. As soon as this occurs, it is arrested by a pinch of the fingers and the container is elevated as far as possible, while the end of the tube is depressed as far as possible, keeping the tube straight to prevent the formation of a trap. The alternate raising and lowering of the container can be repeated until one is satisfied that the bubbles have all been gotten rid of when the metal clip should replace the fingers. The arsphenamin solution can now be poured into the cylinder and the tube filled with it by letting the water run out.

#### Needles

Of all the needles with which I have had experience, the Fordyce needle, 19 gauge, with moderate bevel, seems to be the most satisfactory. An universal handle has been devised which will convert any needle into a Fordyce type. Needles should be kept smooth, bright and sharp.

#### Technique of Arsphenamin Injections

The patient lies at full length upon the table, coat and vest off and one sleeve rolled up. It is important to see that nothing constricts the arm which rests upon a small table at the side covered with a sterile towel. A length of rubber tubing used as a tourniquet is applied about four inches above the elbow and the site of injection painted with tincture of iodine, which may be wiped off with alcohol or a sterile sponge in order to obtain a better view.

One of the veins at the elbow is usually chosen. While not original with us, there is a little trick for manipulating small veins. It is to give the vein a good, sharp direct blow with the middle finger released by the thumb (slapping the arm or a glancing blow will often fail). In most patients, but especially in the negro, the blow is promptly followed by a swelling of the vein which may double its original size. By this procedure, a vein that would otherwise be impossible, may become easy to puncture. I prefer to enter the vein by two distinct movements. With the first movement we transfix the skin over the vein and endeavor to engage the point in its sheath or the surrounding connective tissue, thus fixing it in place. The second movement pierces the wall of the vein on a slant. Ordinarily these two movements are made so quickly that they seem as one. Sometimes, however, the veins roll badly and have to be entered from the side. There is a decided advantage in puncturing the wall of the vein on a slant, for it forms a sort of valve which prevents the escape into the tissue of blood or arsphenamin, both during and after the injection. As soon as the needle enters the vein blood flows from the open end. The point should now be introduced about a quarter of an inch further into the lumen of the vessel. If this is not done, part of the bevel of the point may be in the vein and part outside, particularly if the puncture has not been made on a slant. It is for this reason that a short bevel for the needle is usually recommended.

I am convinced that many sore arms are caused by not introducing the needle well into the vein. With ordinary care there should be no danger of transfixing the opposite wall.

The tourniquet is now removed. The clip is released, the flow of solution being controlled by the fingers, and connection is made between the tube and the needle. A small amount of arsphenamine is allowed to escape while this is being done to prevent the formation of an air bubble. The flow of the solution should begin at once. The operator should inspect the level of the fluid to see that this is so, and the site of the puncture to be certain there is no infiltration. The patients are informed that there should be no pain and are instructed to give notice at once if there is any. Pain in the shoulder may be complained of, and is usually due to an awkward position of the arm. If there is no flow apparent after a second or two the cause must be sought and rectified at once. Some of the more usual causes are the following:—The metal clip may not have been released. There may be a kink in or pressure on the tube. When two tables are being used simultaneously and the two containers are on the same stand, the tubes may become mixed and the container for one table may be connected up with the patient on the other table. The needle may be rusty and clogged, this is of course unpardonable, but stoppage of the flow from this cause is not likely to occur if the wire is only withdrawn at the last moment before the puncture. The needle may not be in the vein at all, having missed it entirely or transfixed it. The point of the needle may have engaged in or partially pierced a valve. A slight withdrawal will remedy this. The bevel of the point may be pressing against the wall of the vein. Counter pressure on the shank of the needle will usually start the flow and this pressure may have to be kept up throughout the whole injection. If the flow is not satisfactory, it is often better to withdraw the needle and try a fresh one on another vein. Under no circum-

stances and for no reason ever try to pass the wire through the needle while it is *situ*. We work with about a three foot fall and take about one minute and three-quarters to inject 60 c. c. and two minutes and a quarter for 80 c. c. This is quite fast enough.

When the injection is completed, the needle is withdrawn and disconnected from the end of the tube, the latter is rinsed in a basin of arsphenamin solution standing by the side of the patient, and then hung up by the clip which has already been adjusted as near the end of the tube as possible. The needle is well rinsed in cold running water, the wire replaced and is then returned to the sterilizer. A piece of sterile gauze is placed over the site of puncture and the patient instructed to hold it there with firm pressure for two or three minutes. He then washes his arm and goes home to bed with instructions to eat nothing until the following morning. Every bit of arsphenamin solution must be emptied from the various containers and then thoroughly rinsed. The rest of the apparatus is also thoroughly cleaned at the same time.

If the smallest amount of arsphenamin solution is left in containers and rubber tubing for any length of time, reactions are sure to follow when this apparatus is used for subsequent injections. In spite of positive orders on the subject, and although I could not prove it scientifically, I was pretty well convinced that this was the cause of the twenty-five slight nitritoid reactions we had about two years ago, all on the same day. On Wednesday evening the patient receives his injection of mercury, and is also questioned and examined as to his improvement or lack of it. After the arsphenamin course is completed, the patients are given six weeks of mercurial inunctions which they can take at sea. As soon as possible after this is completed, they are urged to have a Wassermann test taken either here or wherever they may be.

#### Dosage

At first we gave arsphenamin and mercury each once a week in the morning for six weeks. The initial dose of arsphenamin was 0.25 gms and the weekly dose 0.4 gms given on Wednesday, with mercury salicylate approximately one grain on Friday.

This dose seemed too small, so after the establishment of the night clinic it was increased. Arsphenamin is now administered twice a week (Monday and Friday evenings) for four weeks. The initial dose is 0.25 gms in every case; thereafter the patient receives 0.4 gms on Monday and 0.3 on Friday. On Wednesday evening each patient receives approximately 1 grain of mercury salicylate intramuscularly. Thus he receives 2.75 gms of arsphenamin and 4 grains of mercury in four weeks instead of 2.25 gms of arsphenamin and 6 grains of mercury in six weeks. He is then given a course of mercurial inunctions for six weeks. Subsequent courses of treatment have to depend upon the patients reporting for them. It is impossible to follow any systematic course. When possible we try to give a second course at the end of three months from the last arsphenamin even if the Wassermann is negative. This gives a complete rest of six weeks between courses. The average patient, however, will not consider a second course unless his Wassermann is positive. The same remarks apply to a third course.

(Concluded on page 165)



# The Mechanism Responsible for the Union of the Spermatozoa and Ovum

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From the very nature of this subject it is apparent that no positive statements can possibly be offered in definite explanation of the process in question. At best, it must necessarily be conjecture and a presentation of a theory or theories. To be of value, these must be logically set down and must be based on sound premises. Before presenting his views for consideration, the present writer has thoroughly studied those of other gynecologists, in order to correlate their theories with his own; and it is in the hope that the theory of aspiration may be strengthened by the present writer's observations, deductions, and premises, that he presents this paper.

According to De Lee, the spermatozoa reach the uterus by means of their own natural movements; in addition, he adds that "this is the most accepted theory and is the most natural." The vaginal secretion is acid and kills the spermatozooids within a few hours, while the secretion of the cervix is alkaline, and therefore would have a chemotactic attraction for the spermatozooids and would, at least, find conditions more favorable to their movement. That their "wriggling motion is sufficient to bring a spermatozoid to the tube is shown by the numerous cases of fertilization where the semen has been deposited on the external genitals, as in cases of attempted rape" in which the woman was strong enough to resist; also in cases of pin-hole hymen, where pregnancy has repeatedly taken place.

There are women who never experience either sexual feeling or an orgasm, and who nevertheless become pregnant repeatedly; these cases as well as cases in which the woman is intoxicated, asleep, asphyxiated, or anesthetized, are accounted for by Hirst<sup>2</sup> by the deposit of semen in the vault of the vagina into which the cervix projects, and to which the spermatozoa are attracted by the alkalinity of the cervical mucus and repelled by the acid vaginal secretion; and thus they gain entrance into the uterus. To substantiate this theory as well as that of the motility of the spermatozoa in gaining entrance into the uterus, Hirst as well as Edgar<sup>3</sup> call attention to the fact that, in cases of retroversion where the cervix is not bathed in the seminal lake, pregnancy rarely occurs.

It is logical to assume that the spermatozoa are repelled by the acid vaginal secretion and attracted by the alkaline cervical secretion, for they emanate from an alkaline medium and seem to thrive best in an alkaline medium. This theory could possibly obtain if the spermatozoa were animalculae—as was for a long time believed—and consequently endowed with instinct; but, their origin from epithelial cells of the prostate was proven by Kolliker and Lallemand in 1840 (De Lee). Furthermore, it has been shown<sup>4</sup> that spermatozoa may retain their vitality in the vagina for at least seventeen days.

The motility of the spermatozoa, as observed microscopically, is of a continuous, aimless, twisting, turning, twirling and heaving nature; and since

they are not animalculae, one would not expect their behavior to be affected in the vagina. All the estimates of the rate of travel of the spermatozoa would hold good if the direction of their travel were toward a definite goal, but as shown above, it is quite aimless. Should some of the spermatozoa by chance—and they undoubtedly do—by their own inherent motility gain entrance into the cervical canal where they find a suitable environment, why should they (and how could they) attempt to surmount such insuperable obstacles as the internal os—relatively a closed canal and one through which it is physically impossible for the spermatozoa to force their way—and travel through a continuous more or less downward flow of uterine discharges, through folds of mucous membrane glands, interglandular spaces and an opposing wave of ciliated epithelium, the ostium uterinum as far as the outer end of the tubes and into the peritoneal cavity? The lumen of the internal os is one-tenth inch in width; and that of the ostium uterinum one-twenty-fifth inch (Polak).<sup>4</sup> These measurements probably hold good in cases of postmortem or postoperative excision when the bulk and pressure of the circulating blood is absent; but during life they are relatively closed canals and any measurements which may be cited are those taken when instrumental stretching takes place. As far as the spermatozoa are concerned, they are impervious. The latest book on obstetrics published<sup>5</sup> adds nothing new of any material value except a reference to the observations of Low, indicating that the mucous secretion of the uterus possesses a positive attraction for the spermatozoa, as can be verified under the microscope. This would, however, only partly explain their entrance into the cervical canal. Does it seem possible for spermatozoa to get in the tubes and peritoneal cavity by means of this attraction when deposited on the vulva? Can the theories advanced so far explain the last class of cases? Must there not be other factors involved? Litzman, Wernicke and Beck have proposed aspiration theories (Edgar).

The actual experiments carried out along these lines are summed up by Hirst in the following way: "It has been found in studying the sexual congress of animals, especially in horses that, during the emission of semen and a short time afterward, the uterus exerts an intermittent suction or aspiration upon the seminal fluid, drawing it into the uterine cavity. In the observation of sexual excitement in bitches it has been noticed that the uterus is drawn down into the small pelvis. In experimenting with the electrical stimulation of the sexual organs in female animals it was observed that the uterus grew shorter but broader; that it descended toward the vaginal outlet; that the cervix projected further than normal into the vaginal canal, at the same time becoming softer, shorter but broader, by which action the os uteri was opened. The stimulus being removed, the uterus returns to its normal condition and the os is closed." By way of further subscribing to the as-



piration theory, he adds, *firstly*, that as a result of the postmortem examination of two women murdered at the conclusion of a copulation, the uterine cavity was found full of seminal fluid; and *secondly*, that the investigation of Natanson and Konigstein demonstrated the presence of spermatozoa in the uterine cavity as early as three hours after coitus. Hirst also quotes Schuvarski who claims to have found spermatozoa in the uterine cavity thirty minutes after a coitus.<sup>2</sup> In order to exert a suction or an aspirating action in the human, the same mechanism takes place in the uterus as that described above. Since the organs which are involved, the results which are accomplished, and the motive are identical in man as in the lower animals—except for the fact that in man there is usually a psychological element involved—one may safely infer that the entrance of the spermatozoa into the uterine cavity is effected by the same process in both instances, namely, by aspiration.

Let us for a moment take it for granted that the wave of the ciliated epithelium of the fimbriae can be strong enough to aspirate the ovum when on the ovarian surface and even when the ovum is in the peritoneal cavity on the same side; but can one for a moment conceive how this wave could carry the ovum all the way across? While there is a possibility that the ovum—by means of the processes to be described later—may at times get into the tube directly from the surface of the ovary, still, in all probability, it first enters the abdominal cavity. The ovary, always moist, is situated with its long diameter transversely, and is attached to the tube by its outer and upper end to the fimbria ovarica. This being its only connection with the tube, it therefore seems logical to regard it as a natural tendency for the ovum to slip down into the peritoneal cavity.

The tube itself is situated above the ovary, with its outer opening a distance sufficiently distant from its attachment to the ovary to nullify any suction effect the cilia might create. Those who do major gynecological operations know that the fimbriae have no tonicity, and that they hang loosely in any form or direction, with most of the ciliated surfaces pointing toward the tube instead of toward the ovary. While sudden strong increases of intra-abdominal pressure might occasionally bring the fimbriae in contact with the outer part of the ovary and occasionally carry an ovum along with it there is also a possibility that the ovum may slip directly from the ovary onto the fimbria ovarica; these occurrences undoubtedly are rare. Once the ovum has reached the fimbriated end or the tube proper, there can be no doubt that the ciliary wave which is directed toward the uterus, in conjunction with the vermicular action of the tube, becomes instrumental in carrying it in that direction.

Those who assert that the fibria on the cilia of the fimbria exert an aspirating action, sufficient to draw the ovum onto it, have not given consideration to the fact that it requires the cooperation, if not of the uterus and tube, at least of the tube. The ciliae, in order to exert an aspirating action, would have to be long enough for the ends to meet if not to overlap each other, so that when upright, they would completely close the tubes; further, the waves would have to follow one another in rapid succession and work in complete unison. As the ciliae are of even size and the lumen of the tube is not uniform throughout, this aspirating action is not even possible at the

narrowest part of the isthmus of the tube. It is therefore evident that some other mechanism must be responsible for that suction.

It is commonly thought that intermittent uterine contractions begin some time during the eighth or tenth week of pregnancy or thereabouts; but it is the writer's firm belief—based on conclusions drawn from careful study of many thousands of cases, for the purpose of eliciting uterine contractions—that they are present, if not to a palpable degree, at least in sufficient measure to exert an aspirating influence in all cases, regardless of pregnancy. To a palpable degree they are present in all normal and healthy uteri; and this is evidenced by the fact that the uterus becomes firmer and smaller during palpation. In addition to the regular intermittent contractions inherent in the uterus, there is accentuation of these contractions during or immediately after cohabitation, or during any state of sexual excitement without cohabitation, or during emissio nocturno. During coitus or sexual excitement the uterus contracts and anteverts or retroverts, and, in turn, also causes contraction of the ostium uterinum and isthmus of the tube and traction on the rest of the tube. This contraction and traction on the tube is further influenced by the descent of the uterus—or its tendency to descend—during that period. Where descent is impossible, as in prolapse of the uterus, it will ascend, antevert, or retrovert, according to its natural inclination, as a result of increased intra-abdominal pressure, and so cause a kinking of the tube at the junction with the uterus. During and following its relaxation some of the seminal fluid is drawn into the uterine canal. During contraction of the uterus with the accompanying kinking, contraction and traction on the tube, there is a tendency for its contents to be propelled toward its outer end, and the spermatozoa having previously reached the tube, it seems likely that they will be carried in that direction and, in most instances, stopped at the relatively constricted neck of the ampulla.

During relaxation of the uterus and its rising or straightening out, traction on the tube is removed and it opens and assumes its normal position and contour. It is during such relaxation and immediately following that the suction becomes so great as to aspirate the ovum into the tube whether it happens to be on the fimbria, the ovary, or in the peritoneal cavity. It is this suction alone or in combination with auxiliary forces, to be described below, which may cause the ovum to transmigrate to the opposite tube. The ovum having reached the tube beyond its constricted neck, it is rather difficult to find its way out, as here the ciliary wave helps to propel it toward the uterus.

In those cases of sterility due to retroversion of the uterus which, as a rule, are explained on the theory that the cervix points forward and is not bathed in the seminal lake—the present writer believes that during an orgasm there is, as a rule, a sufficient quantity of seminal fluid deposited on and into the external os to cause conception. A more likely explanation of the cause of sterility in cases of retroversion is that the temporary angular kinking at the junction of the tube and uterus which is present during a contraction is permanent in these cases; consequently the spermatozoa and ovum cannot meet until this kinking is relieved, either by operation or by a pessary which anteverts the uterus and estab-

lishes the aspirating ability. Certain cases of sterility due to anteversion can be explained by a similar kinking of the tube, but in the opposite direction; and many cases of anteversion are due to the same cause but, in addition, to that of the kinking of the uterus itself at the area of flexion.

There are a number of other factors in addition to those already mentioned which influence the aspiratory action of the tubes and uterus with or without uterine contractions, chief among which is respiration. With every inspiration and expiration there is a corresponding increase and decrease of abdominal pressure which, in turn, exerts an influence on the uterus and adnexa.

In this connection may also be mentioned the pulsations of the uterine and ovarian arteries. These as well as the respiratory movements can be demonstrated in many cases upon specular vaginal examination, by inserting into the cervical canal a wooden applicator with a small piece of absorbent cotton wound around the end so as to make it fit snugly. As a result of this procedure, two different types of pulsations will be observed: one corresponding to the pulse which is vibratory and can easily be counted, and one corresponding to respiration which is pendulum-like in motion—coming forward during inspiration, going backward during expiration.

In strong confirmation of the premise that the aspirating mechanism in the human is the same or similar to that in the lower animals, the fact may here be set down that many gynecologists, during specular vaginal examinations of hyperpassionate women, have observed the uterus sink into the pelvis. During many specular as well as digital examinations in one of the present writer's cases (a multipara) the descent of the uterus was intermittent and was accompanied pre-orgasmal movements of the pelvis. On several occasions the sexual excitement was so strong that the speculum was expelled. Digital examinations in another patient provoked pre-orgasmal spells, during which the pelvic movements were more in evidence, but in which the contraction of the vaginal walls, levator ani and sphincter ani, were so strong and so prolonged as to exert a paralyzing effect upon the fingers, with but momentary relaxation. Dilation of the external os (patient was a nullipara) could not be felt nor, under the pressure and suction of the fingers upward, could the descent of the cervix. During actual intercourse, however, the mechanism is somewhat different, as the upward and downward movements of the male organ permit a corresponding movement of the uterus, in which case there undoubtedly is an appreciable dilatation of the cervix, or at least sufficient to permit suction.

De Lee objects to all the theories of aspiration of the spermatozoa into the uterus on the ground that it would also suck up various germs and that the uterine cavity is sterile. These objections the present writer would attempt to answer by the fact that the normal residual germs in the vagina are harmless, and that a more thorough and continued investigation would probably reveal their presence in the uterus; if not, it is possible that they cannot thrive in an alkaline medium and are immediately digested, but in the presence of virulent germs in the vagina (i. e., gonorrhea), they are aspirated into the uterus. The fact that their presence in the uterus and adnexa is not always in evidence can be explained on the grounds that in the majority of cases they reach the

uterus at a time when they are so devitalized and attenuated that they cannot thrive there for the following reasons: (1) early institution of treatment; (2) on account of the inflammatory condition of the vagina and vaginal portion of the cervix, the aspirating mechanism of the uterus, is inhibited with or interfered with; (3) the fact that the most important factor in stimulating aspiration—cohabitation—is, as a rule absent—at least in the acute stage. (4) If cohabitation takes place, owing to the formation of the seminal lake, the germs are so diluted that the uterus can, as a rule, take care of them; this is also influenced by the minimal aspiratory action present at this time. (5) The natural immunity some women (as well as men) possess to this as well as other infections. (6) Uterine gonorrhea may be coincident with vaginal gonorrhea from the original exposure, but if the uterus is capable of ample drainage, and particularly when the tubes are not patent, not only will the tubes and perimetrium not be involved, but the uterine condition will clear up together with that of the vaginal, or even sooner. But uterine as well as adnexal and peritoneal gonorrhea do occur, and the only possible means for the gonococci to enter the uterus is by the process of aspiration.

Crossen<sup>6</sup> states that extension of gonorrheal inflammation takes place almost invariably along the uterine mucosa into the tube, any further extension being toward the ovary and peritoneal cavity. He cites Reidel who reported fifty-six girls under ten years of age who were operated for appendicitis, five of whom had peritonitis due, not to appendicitis, but to acute salpingitis. He states positively that the infection reached the tubes by way of the vagina and uterus and that gonorrhea was excluded in every case. Cultures showed the ordinary pus germs. The inflammation was virulent and every patient died in spite of operative treatment. He observed the same clinical picture in two girls past ten years of age, both of whom died. This proves that virulent germs besides gonococci, present in the vagina, do gain admission into the uterus and beyond, but it seems evident that their mode of travel cannot be satisfactorily explained by the "repulsion-attraction theory." Further, the theory of the inherent function of motility of the spermatozoa can certainly not be applied here. It might, however, be explained on the basis of continuity, were it not for the fact that the aspiration caused by contraction and relaxation of the uterus causes this extension of the germs.

We have thus far tried to prove the negative phase regarding the purpose of the motility of the spermatozoon; its true purpose in the absence of incompatibility—as there seems to be a selective as well as a chemotactic process present, as only one spermatozoon out of many fuses with ovum—is to attack and penetrate the ovum, once it is near or in contact with it. The activity of the spermatozoon and the passivity of the ovum and their selective affinity and their union may well be likened to a primordial sexual congress.

Regarding the method of conveyance of the ovum to the tube and uterus, it may be pertinent to quote the following statements of Edgar: "The oldest theory of this conveyance—that held by Rouget—was that the fimbriated extremity of the tube became erectile and, aided by muscular contraction, grasped the ovary. The existence of a peculiar erectility in the tubes has, however, been disproved, as experiments show that it possesses none of the

characteristics of erectile tissue. Galvanization of the tubes shortly after death produces only vermiform action which has no effect on the position of the fimbria." Henle (quoted by Edgar; 3) in presenting his theory as to the transmission of the ovum into the uterine cavity, takes the stand that the ova are carried along in the serum by currents generated by the ciliated epithelium which covers the fimbriae of the tubes, the ciliary motion causing a current in Douglas' cul-de-sac. De Lee also believes that the current created by the ciliated epithelium conveys the ovum into the tube, and adds that the ovum appears on the surface of the ovary with its clumps of cells from the cumulus oöphorus and a few drops of liquor folliculi; further, that it is caught in the current and led to the tube. Cragin<sup>7</sup>, Hirst, and others, concur in this view. Kahrer's theory (Edgar) is that the ova are ejaculated directly from the follicle into the tube.

The fact that the ovum can reach the tube and uterus from locations other than the ovarian surface has been proven by Pinner (Edgar) who injected powdered insoluble coloring matter into the abdominal cavity of a rabbit. He found particles of this material in the uterus and vagina, postmortem. Lode (quoted by Edgar; 3) has obtained similar results with the egg of a tapeworm. It has been conclusively shown by the observation of Kussmaul, Leopold and Kelly (quoted by Williams) and others, that "transmigration" of the ovum to the opposite side and into the opposite tube often takes place. Can the cilia create such suction also?

Failure to demonstrate these pulsations is, as a rule, due to pressure of the speculum or to adhesions; the tendency, however, is constantly present; thus visibly demonstrating the pulse-respiration ratio. Included among other factors which contribute to intra-abdominal pressure may be mentioned talking, singing, yawning, coughing, sneezing, sighing—in fact, all forms of exercise and the like. The peristaltic movements of the intestines is another factor which influences the conveyance of the ovum. Although this action in turn is influenced by the aspiratory action of the uterus and the fluctuation of intra-abdominal pressure; these movements are just as likely to produce a negative effect. These auxiliary factors may not be sufficient to aspirate the spermatozoa into the tube or peritoneal cavity, but they at least contribute in a measure toward bringing them into the cervical canal, and if already present in the uterine cavity as a result of uterine contraction and relaxation into the tube; and the ovum onto the fimbriae. This is to be accounted for, not on the basis of their strength but, rather, on the basis of their frequency.

The inherent uterine contractions, their accentuation during all stages of sexual excitement, independently or in combination with all the auxiliary forces, are sufficient not only to explain normal conception, but also to account for conception in cases of pin-hole openings in the hymen in which the seminal fluid has been deposited on the vulva only, and in cases in which women never experience an orgasm and in which pregnancy takes place in spite of contraceptive measures; it may also account for cases of conception during states of unconsciousness—as under anesthesia, during hypnotic spells or spells of drunkenness, and in all cases where definite causes of sterility are absent—as well as for the uterine, adnexal and peritoneal infections with their starting point in the vagina.

### Conclusions

To sum up the writer's conclusions, it may be stated that the presence of spermatozoa in the uterus, tubes and peritoneal cavity, is to be explained neither on the basis of repulsion of the acid vaginal secretion, nor of the attraction of the alkaline cervical secretion for the spermatozoa, nor, further, on the basis of the motility of the spermatozoa. Their presence is to be accounted for solely on the basis of aspiration in conjunction with auxiliary forces. The real function of the motility of the spermatozoa is, in the absence of incompatibility, to enable it to attack and penetrate the ovum, once it is near or in contact with it.

The ovum reaches the uterus not by means of the fimbriae grasping the ovary (although the possibility of its occasional occurrence, through extraneous causes, cannot be entirely ruled out), nor by the suction created by the movements of the ciliated epithelium of the fimbriae, but by means of the aspiration caused by the contraction and relaxation of the uterus and auxiliary forces.

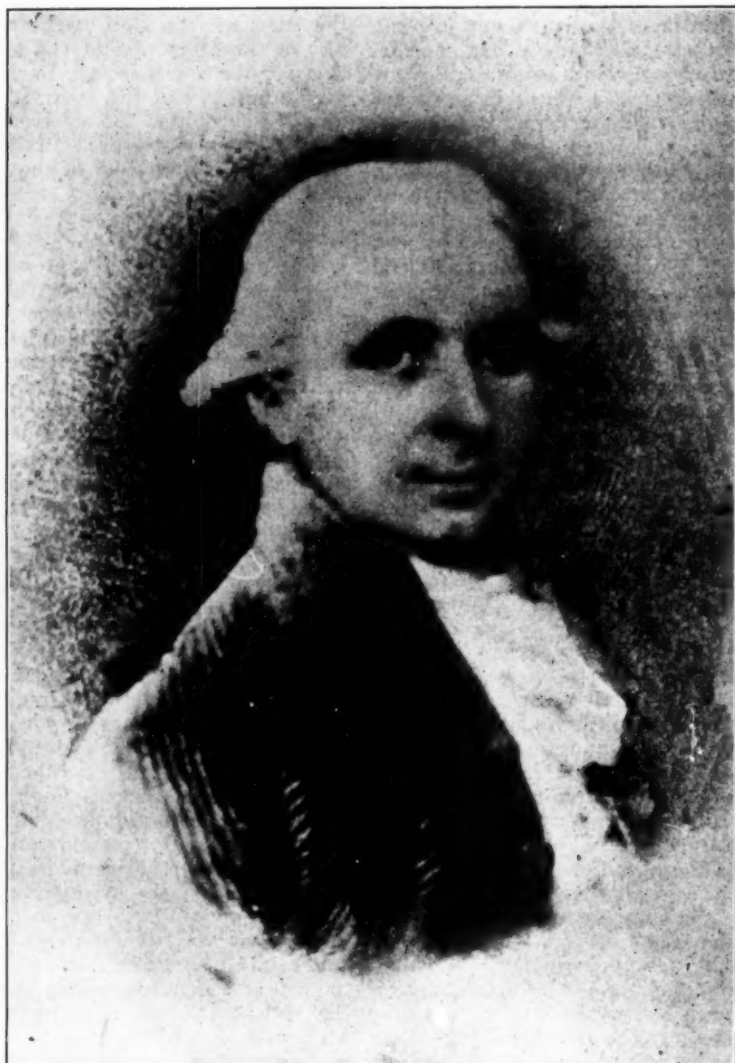
Contraction and relaxation of the uterus is constantly present but accentuated during and after conjugal relations, emissio nocturno, or any state of sexual excitement. Great or frequent increases and corresponding decreases in intra-abdominal pressure are a concomitant and actively influencing factor in this aspiratory action.

During sexual excitement, and particularly during cohabitation, the uterus descends into the pelvis, contracts, ante or retroverts according to the usual inclination of the uterus. Its effect on the tube is as follows:—The descent of the uterus causes traction and contraction of the tube; the accentuated version causes a kinking of the tube (more or less) at the junction with the uterus, and thus, further diminishes the lumen. This whole action is equivalent to the result of the act of removing a piston from a syringe whose walls are collapsible. When the piston is entirely removed, the syringe, or uterus, including the external and internal os, and the ostium uterinum as well as the tubes will dilate to their fullest capacity and aspirate anything that will come along at that moment:—the spermatozoa will enter the uterus, and the ovum, the tube. During the traction, contraction and kinking of the tubes there is a tendency for its contents to be forced outward toward the peritoneal cavity, and if the spermatozoa have reached that far they will be carried in that direction. During its relaxation the ovum is drawn into it. Here it must be remarked that owing to the fact that the tubes and uterus join at less than right angles, that the ostium uterinum and the isthmus are relatively constricted, and that the tubes and uterus are of different consistencies, therefore the aspirating action of the two are not simultaneous in their start nor are they alike in their duration and intensity; the response of the tubes being vermiform in nature—otherwise the aspiration of the uterus on the seminal lake would be so strong as to carry it rapidly through the tubes into the peritoneal cavity, and so preclude the aspiration of the ovum into the tube during its relaxation. In other words the ostium uterinum and isthmus act as controlling and regulating valves so as to facilitate the ultimate meeting of the spermatozoon and ovum.

The auxiliary factors are those forces which act by increasing and correspondingly decreasing the

(Concluded on page 166)





### Doctor Richard Bayley

1745 - 1801

*(Portrait reproduced from a photograph of a miniature in the possession of Doctor Bayley's great-granddaughter, Mrs. Walter Large, of New York City.)*



FIRST Health Officer of the Port of New York under the Federal régime; first professor of anatomy Columbia College, 1792; later held chair of surgery; on attending staff New York Hospital thirteen years; did much pioneer work in ophthalmic and general surgery, croup and yellow fever and was startlingly modern-minded in his conception of infection and contagion; creator of the State quarantine laws (See extended sketch in THE MEDICAL TIMES of November, 1923).



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## Heredity and the Uplift

In the May issue of the MEDICAL TIMES we discussed the views of Professor Parshley, of Smith College, on heredity and the persistence of society in assisting the "unfit" to survive and propagate. From a letter since received, written by Professor Parshley, we quote the following pertinent remarks:

"You have grasped my ideas in masterly fashion and I appreciate this wider publicity which they are receiving in the medical profession.

"But like many others you now take what is perhaps an undue interest in one side of the question:—i. e., inherited factors as opposed to environmental. I feel that the latter have often been over-exaggerated and hence welcomed the opportunity to put in strong terms the case against the reformers and uplifters. Do you believe that the environmentalist uplift promises much in the way of actual, innate progress or improvement in human capacities? Do you think that the improved breeds of, say, cattle were developed through the application of good feed, warm quarters, castor oil, and the curry comb?

"Now, all these things are of advantage, for cattle as well as for men; and the article I am sending you puts the matters clearly. But medical attention to the individual, for instance (which no one appreciates more keenly in time of need than I do), has nothing to do with evolutionary advance, and (as I said) any program of comprehensive reform (with an eye to the future) which fails to take this into account will do more harm than good in the end.

"As to my alleged attitude toward condemning Christ, Nietzsche, Napoleon, Goldsmith, *et al.*, because of youthful weakness or ultimate insanity: not at all. My belief is that given a favorable environment the individual should work out his own salvation and be exalted in direct proportion to his actual achievements. The aristocracy which I favor is one to which ability gives access and from which failure involves expulsion. Let doctors and teachers do their damndest and best for everyone that innate qualities may be fully developed; but let it be understood that in this way inherited ability will become

even farther above innate stupidity than it is at present—a perfect environment will merely serve to emphasize individual differences."

We have read the article alluded to by the Professor (Eugenics: A Contribution to the Annals of Reform, *American Review*, March-April, 1924, number) and find that in practice the eugenic programme will include five elements, as follows: (1) identification of the good and bad among existing strains; (2) repression of the bad; (3) encouragement to reproduction of the good; (4) determination of the influences, if any, capable of vitiating good stocks; (5) provision of favorable circumstances for the good. Only the last immediately concerns us.

The Professor, in the course of his discussion of this fifth element, remarks that "poverty of environment . . . will inevitably defeat the eugenic aim by retarding the development in the individual of worthy traits and often by preventing even their recognition as such; and thus the eugenicist has a vital interest in any intelligent enterprise for human betterment, if only it does not involve a waste of necessarily limited resources through neglect of the innately superior in favor of the weak . . . evidently it falls within the scope of the eugenicist to make sure that the chosen are offered appropriate education and are not confronted by slum conditions so impossible as to crush all but the most extraordinarily gifted. It is here that the biologist can at last make common cause with the environmentalist reformer."

This line of argument makes us feel much more comfortable about the part being played by the medical profession than did the Professor's hard-boiled pronouncements in the *American Mercury*, upon which was founded our first editorial.

Without pressing the point, we think that Professor Parshley, in his letter, begs the question as posited by him in the *American Mercury* when he protests that no one appreciates medical attention to the individual in time of need more than he, and that doctors and teachers should do their best for everyone; and the article on eugenics seems to be a further begging of the question. Have we here an interesting instance of multiple personality?

To us, it seems that the only safe programme is one that will provide decent environmental conditions for all men. Much of the degradation of human beings grows, not out of heredity, but out of special privilege, industrial exploitation and private monopoly. So long as our present social system is what Alfred Russel Wallace called it—the rottenest that the world has ever seen—so long must we care for the masses as best we may, lest a Verlaine, or a Francis Thompson, or a Mark Twain, or a Dickens, or a Chatterton, fail to live, function, and create. Humanitarianism of this sort is not sentimentalism; it has worked well and produced dividends; in a blind kind of way this has been sensed by those who have financed it; the pragmatist finds it sound doctrine, whatever dogmas may issue from the biologists. The foulest dunghills have grown the fairest lilies. Professor Parshley knows the ethnic and biologic truth about the Pilgrims themselves, other than the leaders.

Let the medical profession be proud because in caring for sick humanity in its asylums and wards and hospitals it has nurtured a Charles and Mary Lamb, a Henry M. Stanley, and an Edgar Allen Poe.

When you get away from these moorings you are bound to enter the realm of the Nordic myth. Then you will find yourself identifying the good as Nordics and the bad as non-Nordics. *Provision of favorable circumstances for the good*, the Professor's fifth element, will,

of course, then come to mean cakes and ale only for the white, Protestant Nordics, a reduction to absurdity.

Professor Parshley will now have the advantage of saying the last word, and we extend a cordial invitation to him to say it.

Jill-o'er-the-ground is purple blue,  
Blue is the Quaker-maid,  
The alder-clump where the brook comes through  
Breeds cresses in its shade.  
To be out of the moiling street  
With its swelter and its sin!  
Who has given to me this sweet  
And given my brother dust to eat?  
And when will his wage come in?

—From "Gloucester Moors,"  
by William Vaughn Moody.

### National Ills

Mary Alden Hopkins makes some shrewd observations in the June *American Mercury* regarding the reasons why the old New England stock is losing control of the land to the Italians, Poles and Czechs. It is only true in part that none but half-wits and lazy folk remain on the farms while the best blood pours into the cities. As a matter of fact many representatives of the old stock are still living on the land of their forefathers.

The old stock is disappearing, fast enough, but the reasons are three-fold. One of these reasons is quite obvious. These people have no genius for what might euphemistically be called "love-making." They do not marry and they do not reproduce. Another reason, also fairly obvious, is the obsession that work is a curse laid on man by an angry God. The third reason is what interests us from a medical standpoint. When a New Englander takes to drink his farm breaks out in leaky roofs and sterile fields, whereas however much the Slavic peasant drinks he does not neglect his work. The latter gets drunk on hard cider every day, and yet doesn't go to the poor-house. His farm remains prosperous. You will find New England drunkards working as hired men for Central Europeans who drink twice as much hard cider themselves.

It seems to us that these are the very factors, particularly the last, which will determine the issue all along the national line between the old stock and the newer elements. Prohibition will hasten the decimation of the old stock because this stock is even more vulnerable to the grade of liquor now being consumed in vast quantities than to the ante-Prohibition stuff.

Curiously enough, it is the Puritanism of the old stock which has brought Prohibition into being. Whom the gods would destroy they first make mad. While the right hand writes the Eighteenth Amendment the left hand brews and carries to the lips the cup that is poisoning the commonwealth unto death.

We can sometimes get a hunch on what the philosophers mean when they talk about our civilization carrying within itself the seeds of its own destruction.

## Miscellany

Conducted by ARTHUR C. JACOBSON, M.D.

### A Classic Phrase Revised

Dr. Edward E. Cornwall has wittily retouched "per aspera ad astra," in order to give point to a criticism of the evil side of a certain widespread habit; he renders it "per aspirin ad astra."

### The Arteriosclerosis of Statesmen

That clever Australian medical man and writer, MacLaurin, in his "Post Mortem, or Essays Historical and

Medical," makes the following astute remarks about some ancient arteriosclerotic statesmen and points a moral for the modern world as well: If Charles V. had not had arteriosclerosis he would probably not have dallied with the pretty singer, Barbara Blomberg, in order to cheer himself up, out of which dalliance came the notorious bastard Don John of Austria; if he had not had arteriosclerosis he would probably not have abdicated in 1556, when he should have had many years of wise and useful activities before him; if his judgment had not been warped by his illness he would probably never have appointed his son, Philip II., to be his successor as King of the Netherlands; he would have seen that the Dutch were not the sort of people to be ruled by an alien; if Philip had not been eternally preoccupied with his senseless struggle against the Dutch, it is probable that he would have undertaken his real duty—to protect Europe from the Turk. When one considers how the lives of the arteriosclerotic Charles and his similarly afflicted son might have been altered had their arteries carried a lower blood-tension, it rather tends to alter the philosophy of history to a medical man.

When we consider, says MacLaurin, that the destinies of nations are commonly held in the hands of elderly gentlemen whose blood-pressures tend to be too high owing to their fierce political activities, it is not too much to say that arteriosclerosis is one of the greatest tragedies that afflict the human race. Every politician should have his blood-pressure tested (and his urine examined) about every three months, and if it should show signs of rising he should take a long rest until it falls again. "It is not fair that the lives of millions should depend upon the judgment of a man whose mind is warped by arteriosclerosis."

One wonders to what extent the genesis of the late war had definitely to do with the arterial state of the admittedly old men who staged, directed and settled that merry romp.

### Paraffinoma

(Continued from page 148)

From all of the foregoing, it would seem that it may reasonably be concluded that the use of paraffin for cosmetic rhinoplasty is dangerous in the hands of well equipped surgeons, and doubly so in the hands of unscrupulous, uneducated, and unqualified persons.

My own especial interests concerning paraffin injections have centered upon the effects of paraffin on the surgical anatomy of the infiltrated part; upon the proper technique for the removal of the tumor; upon the after-treatment, and the paraffin scars.

When paraffin is first injected into the face, it doubtless infiltrates all the softer tissues, and the immediate effect is excellent; it then hardens, and a period of quiescence follows, which, according to the recorded histories, may last anywhere from three months to twelve years. At any time during that period, the hardening mass or masses may gravitate to more dependent locations; for example, paraffin injected for a saddle-back nose may descend to the lower part of the cheeks. As the paraffin gravitates downward, it carries with it, and away from their normal relations, nerves, blood vessels, veins,—in fact, any or all of the soft tissues. Paraffin also gravitates toward the surface, so that masses which were once buried deep in the tissues come to lie immediately under the skin. The injected part, usually the face, loses its normal contour, becomes swollen, lumpy, and inhuman in appearance.

The removal of paraffin is one of the most difficult operations the plastic surgeon has to perform. If it has been injected in considerable amount, all of it cannot be removed at one operation; but only that portion which has become superficial, and which lies immediately underneath the fat and fascia of the face can be removed with safety. It will be found after the preliminary operations have been done, that owing to the very marked infiltration of the paraffin into all the tissues, and the displacement of the normal tissues, a cavity remains with hard-lined walls which will not collapse. This cavity must be filled with areolar tissue, during the operation, and the remaining deeper paraffin will eventually find its way into this areolar tissue, and may then be removed later. The stretching or overgrowth of the skin over the masses of paraffin makes it always advisable to take out a section of skin, in order to restore the contour of the part. In other words, the operation which may be designated "paraffinectomy" should not be begun merely with an incision through the skin, but with the excision of that portion of the skin found bulging over the paraffin. This plan has the advantage of frequently making transplantation of fat unnecessary, and also restores the normal contour.

I should emphasize the fact that in spite of every precaution paraffin scars are, as a rule, *very distinct during the period of the preliminary operations*. The wounds are difficult to heal, and after the preliminary work has been completed, the surgeon should expect an excessive exudation of serum between the wound edges, and this condition may continue until all surface, and practically all deep paraffin, has been completely removed from the tissues.

After all the preliminary operations for the removal of the paraffin have been done, it is then proper to operate on the paraffin scars. I recommend the technique described in my article on wounds. (Oblique cutting knife and subcuticular horse-hair suture material, and the application of turtle bile dusting powder to the wound edges). The transplantation of areolar tissue is simple. After the paraffin has been removed, the cavity is packed with sterile gauze; an incision is made in the outer part of the thigh, and the necessary areolar tissue removed and placed immediately in the wound. Every aseptic precaution should be used in the removal of this tissue, and every precaution that applies to an abdominal operation should apply to an operation for the removal of paraffin. *Under no circumstances, should a surgeon attempt the removal of paraffin through the mouth.*

If the procedures described are carried out with care, the results are surprisingly good. After the lapse of a few months, the scars are so fine that they are practically imperceptible.

Still and notwithstanding the fact, that paraffinoma yields a certain degree of acquiescence to the surgeon's knife, that basic fact remains, that it should never have existed in the first place, and the sooner legislation can be brought, to bear upon this real and common danger, the better for the community at large.

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412 West End Ave.

#### Treatment of Syphilis

(Concluded from page 157)

#### Conclusions

It is almost impossible to draw reliable conclusions from the records alone.

Our experience in this clinic with other anti-syphilitic remedies has been very limited. We have given four injections of neo-arsphenamin, seventy-five of silver arsphenamin, and fifty-seven of iodid of quinin and bismuth. My impression and belief is that there is no remedy at present known that compares with arsphenamin in efficiency and usefulness.

Clinically we are getting most satisfactory results, especially since the establishment of the night clinic and larger and more frequent dosage. Neo-arsphenamin, silver arsphenamin and all the other preparations of arsenic that have ease of preparation and administration to recommend them, are either lacking in arsenic contents, serological efficiency or both. A few of our patients, and the number seems to be increasing, are so anxious to be cured that they ask for more treatment. These are permitted to take a six weeks' course, receiving twelve injections of arsphenamin and six of mercury. It is more than likely that these cases on account of their desire to be cured, will report for observation often enough for us to draw some useful and reliable conclusions in future. To those of us who are familiar with arsphenamin preparation and administration it has become a comparatively easy procedure. One of us, using two tables simultaneously and with the assistance of one orderly, has prepared and administered thirty-six doses within an hour and a half. There was no unseemly hurry, neglect or confusion.

Any one who has never given arsphenamin or who has never seen it prepared and administered, or who gives it only at long and infrequent intervals will probably find the distilling of the water as well as the other procedures described here irksome and troublesome.

It may be that our technique is an over-cautious one and that it might be simplified. The difficulty would be to determine exactly in what way this could be done; exactly what to modify and omit and what not to.

Nevertheless, the necessity for being both chemically as well as surgically clean and accurate is something that can never be avoided or disregarded. A competent surgeon who is conscientiously both of these will not be likely to make grave mistakes in other particulars.

136 West 70th St.



## TREATMENT OF ALIMENTARY ANAPHYLAXIS (ALLERGY)

FREDERIC S. MASON, M.D.,

New York

When the wild Kareens of the Burmese jungles offer the stranger "pickled tea" flavored with "Nippi" (fermented fish) as an appetizer; the despised pariah of India regales himself with tainted meat as a tit bit, or the epicure of Paris or London consumes anchovies, strong cheese and highly seasoned game, they show the way that science must follow in order to combat anaphylactic manifestations of the alimentary tract.

These appetizers contain protein substances originating in bacterial fermentation which results in a molecular re-arrangement and reduction to simpler forms (peptone, proteoses, polypeptids and even amido-acids). These less complex nitrogenous bodies have the property of modifying toxic substances with which they come in contact, elaborating enzymes and promoting cleavage of ingested food proteids thus aiding assimilation by stimulating normal digestive processes.

This is the secret of man's instinctive selection of "gamey" foods; it is also the basis of the theory of anaphylactic desensitization now shown to be our best means of correcting abnormal gastro-intestinal disturbances.

In considering the causes which have led cultured as well as primitive peoples to use unsavory food products, we must remember, that it is difficult to differentiate between medicinal, nutritive or innocuous agents, or to say positively how anything will behave when taken into the stomach. Under some conditions, foods may become violent poisons, ptomaines, toxalbumins and other toxins and such purine bodies injected under the skin may produce serious, if not, fatal affects.

On the other hand, putrid foods are eaten by savages with impunity and even relish. These phenomena are difficult of explanation. Nevertheless, it is now demonstrated beyond peradventure by French clinicians of repute, that many alimentary anaphylactic manifestations such as flatulence, fetid breath, food dermatitis, pruritus, so-called "bilious attacks" with violent headaches, bloating, stomach splash and other acute forms of gastro-intestinal indigestion as well as urticaria, migraine and many obscure affections indirectly arising from disturbances of the normal digestive functions or defective endocrine control, are amenable to treatment by the mouth with almost homeopathic doses of soluble protein derivatives.

While there is some difficulty in presenting them in a form acceptable to delicate women, children and invalids, where this is successfully accomplished, I have found that patients acquire an extraordinary appetite, the tone to the gastric musculature is improved and symptoms of alimentary anaphylaxis are almost invariably relieved.

It is important to prescribe proteid derivatives from half to a quarter of an hour, but for foul breath, flatulence and headaches, I give them any time and usually obtain almost immediate relief.

When necessary to correct an acid stomach, a little nux vomica and alkali salts help matters.

16 Fifth Ave.

## Spermatozoa and Ovum

(Concluded from page 161)

intra-abdominal pressure. They act in conjunction with the aspiratory mechanism described above, during its presence, but their aspirating activity is largely independent and due more to their frequent repetition than to their strength. Chief among these, on account of its frequency, is respiration. Other factors are coughing, sneezing, yawning, talking, straining and all kinds of exercises. Another factor whose activity is influenced by the changes in intra-abdominal pressure and the aspiratory action of the uterus, and whose activity is just as apt to bring about negative results, but whose influence is always present, is the peristaltic movements of the intestines.

The auxiliary forces may not by themselves bring the ovum into the uterus or the spermatozoa into the tubes, but their influence is sufficiently strong and continuous to bring the spermatozoa into the cervix and the ovum onto the fimbria and even into the tube. These help to explain cases of conception where the aspiratory mechanism of the uterus is imperfect or insufficient. !

1851-7th Avenue.

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## Gonorrhea

(Concluded from page 150)

The sexual desire is a God given impulse and is present at times in some degree or other in all persons, in women not quite so frequent as in the male. It is a natural condition and will not be defied indefinitely any more than other physiological acts will be—this is particularly so in the male. An experience of many years with large bodies of men has caused me to form very definite ideas along these lines.

### Executive Control

Many different orders have been issued by pseudo brilliant officials to control venereal disease. Such as laws forbidding prostitution, or other illicit sexual relations so called. King Canute, with all his pride, could not repel the ocean tide and where real human nature is concerted executives are in much the same position as the King. The placing of police in front of suspected houses, or the following of young couples in the hope that they may commit themselves is useless.

In one city the Health Department endeavors to obtain the name of the infected female and isolate her, but why quarantine the woman and not the man. This is an inconsistency that will not work. Men do not respond to the idea of giving away the woman and in most cases, it might be very difficult to say who was the real offender. Most of the reform methods are too stupid to mention further. In view of ill advised legislation, prostitution has been widely distributed from one section of the country to the other. Incidentally it must be realized that only about 20% of venereal disease is from that particular source. No laws will ever reach the clandestines and here is where most of the trouble is spread. It is the ignorant man or woman who know not properly how to care for themselves.

Sexual relations will always take place as long as there is such a thing as the sexual instinct, even among those who are so active in proposing laws to prevent it. With the disappearance of this instinct the human race will soon cease to exist. Scare campaigns are of no value, as I have seen medical students go out for a frolic immediately after attending a venereal clinic where the worse types of cases were seen.

Realizing that it is impossible to prevent this so called illicit intercourse we must try other methods to prevent the diseases that may arise. One of the most common is the use of the condom by the male. In the female douches of potassium permanganate are said to be of value. In the male, urethral injections of 1 or 2% of protargol or 10% argyrol and the use of calomel ointment 33% are of very great value. In connection with this of course ordinary cleanliness will go a long ways toward preventing any disease.

Let me beg of you not to be hypocrites but to treat your venereal cases with kindness. Remember that they are merely unfortunates, where many others have been less so. I refuse to subscribe to the idea that the venereal patient is a moral leper, but feel that he or she is deserving of the same treatment and kindness at our hands as the patient who suffers from typhoid or pneumonia.

These conclusions have been reached through an experience of almost 24 years in the practice of medicine, during which time I have treated and investigated thousands of these cases. Incidentally I have studied the customs and characteristics of many lands and find that there are very few who can throw stones. So let us be kind.

229 West 101st Street.

#### The Precipitin Reaction of Thyroglobulin

The antigenic properties of thyroglobulin were studied by Ludvig Hektoen and Kamil Schulhof, Chicago, and it occurred to us that it would be of interest to study them. They prepared thyroglobulin from beef, swine and human thyroids in the usual way, but with special efforts to obtain as pure a product as possible. The results of this work indicate that human thyroglobulin, prepared as described, contains a main, strictly specific antigen and also lesser antigens that in the rabbit may call forth precipitins for thyroglobulins of other species. The beef and swine thyroglobulins used in these experiments acted as strictly specific antigens.—(F. A. M. A.)

John Ridlon and E. J. Berkheiser, Chicago, state that no examination of a painful back is complete and conclusive without an examination of the circulatory system, and that the treatment of many painful backs ought to be directed by the internist and not by the orthopedist. The routine employment of girdles, braces and plaster jackets and extensions in bed should be regarded with skepticism in the treatment of painful backs. Three cases are reported.—(J. A. M. A.)

## Diagnosis and Treatment

### A Tuberculosis Cure Not Needed!

Discussing tuberculosis research, S. J. Maher of New Haven, Conn., ridicules the objection that a tuberculosis cure is not needed; that we already have the tubercle bacillus on the run, and that within a few years, by the use of our present methods and weapons we will have the tubercle bacillus killed or captured. That, of course, is arrant nonsense he says. Statements of that kind are possibly excusable when made by some recent convert to the anti-tuberculosis crusade, but they would not be excusable if made by a leader of that crusade. In fact, such statements are never made by a ranking officer of the crusade, the men to whose efforts the past successes of the crusade are mainly due. Such statements are not made by the general practitioners of the country nor by the medical officers of state tuberculosis sanatoria, the men who, in spite of their best endeavors, in spite of their utilization of all the methods and weapons at their command, watch with an agony that is almost despair, when so many of their patients slip and slide, further every week, down the melancholy way that ends in the cemetery.

These men have no illusions on the subject of the conquest of the tubercle bacillus. They realize, of course, that tuberculosis victims are fewer than ever before; that the community that is clean, well-fed, properly housed, and amenable to the requirements of modern sanitation, has much less tuberculosis than the community in which these conditions of life do not obtain; but they also realize that tuberculosis snatches victims from among the cleanliest and the best-fed and the best-housed, and that when the tubercle bacillus has succeeded in lighting his fire in a human being, whether that human being comes from the ranks of the rich or the poor, there is no physician living today who can honestly promise the patient that he will surely cure him,—that he will thoroughly extinguish that little fire of tuberculosis. This is true no matter where the patient goes or what the patient does, or what the patient refrains from doing.

The general public is grateful to us for the effect that our crusade against tuberculosis has had in cutting in half the death rate from tuberculosis, but even the general public is not deceived by the recent catechumens who insist that their new faith is all that is necessary to banish tuberculosis. No, indeed, the general public is not deceived! Witness, for instance, the intense and worldwide interest that is shown by governments, scientists, medical journals, and the great newspapers, whenever the rumor rises that something in the way of a tuberculosis cure has been discovered. It doesn't matter how weird, or bizarre, or vague, or mysterious the new treatment may be, the whole world is stirred by the thought that perhaps its long-hoped-for blessings may have come at last.

It is evident that tuberculosis research is necessary, that tuberculosis research can be done and should be done at state tuberculosis sanatoria, that the cost of tuberculosis research at state tuberculosis sanatoria is trifling, and that the general public as soon as it realizes what opportunities abound at state tuberculosis sanatoria for learning the truth about tuberculosis, will, with a stern voice, demand that these opportunities be no longer neglected.

Connecticut has a formula for research and it is a very simple one. We have five tuberculosis sanatoria,—three for adults, Hartford, Shelton and Norwich; and two for children, Meriden and The Seaside at Niantic. Once a month the State Tuberculosis Commission holds a meeting at one or other of these sanatoria. To this meeting all the medical officers of all the sanatoria are invited, and the medical staff of the visited sanatorium is expected to have ready for presentation and discussion some serious study or bit of research work, important enough to repay the visiting physicians for the time and trouble they have spent coming to the conference. Each sanatorium has two of these conferences in a year, and has, at least five months to prepare for each meeting.

To these monthly medical conferences, prominent physicians of our own and our neighboring States, known to be especially interested in tuberculosis, are frequently invited. Of course, when the staff of a sanatorium has a subject big enough to occupy its attention for more than one five-month period, it makes one or more preliminary reports before summarizing the whole work.

In order to make the discussions as interesting and spicy as possible, all the visiting physicians are told, a week in advance, what kind of work it is intended to report. The newspapers are keen to use any available information as to the doings at these conferences. We feel that it is perfectly legitimate to let them

have news items concerning the meetings, and in these items to give credit to the men who have done the work.

In regard to the recurring question as to where we get medical superintendents, who are both good executives and good research workers, the answer is, we grow them in Connecticut. One of our superintendents was born in Pennsylvania, one in South Carolina, and three in Connecticut, and none of the five was a sanatorium superintendent before entering the employ of the State of Connecticut. None of the five had any other special preliminary training in laboratory or scientific technique than such as is part of the training of physicians in the ordinary first-class medical schools. These men not only manage their sanatoria in a way that brings them praise, but they also supervise tuberculosis clinics in the surrounding towns, and to this work give several hours a week. Yet, as is apparent from the incomplete list of papers that has been handed to you this morning, these five medical superintendents and their assistants have made some ambitious efforts to solve important tuberculosis problems. And many of their reports have not only been published by our best journal, but they have been quoted approvingly by the best foreign reviews.

One small but important detail in Connecticut's formula for sanatorium research is our employment of an expert laboratory technician who spends one week a month at each of the four largest sanatoria and makes culture media and stains, and, at every visit, examines the sputa of all the patients. This relieves the medical staff of the time-killing tedium of the laboratory. Of course, special studies of sputa, and special kinds of culture media are made by the physicians themselves, and they constantly check up the routine laboratory reports.

Another point in our formula is this: An insistence that tuberculosis research is not necessarily a matter for the chemical or bacteriological laboratory. It is quite possible that the solution of the tuberculosis problems will be discovered by some observing worker to whom the test tube and the microscope are unknown or abhorrent,—somebody, perhaps, to whom the x-ray, or radium, or the sunlight will give an epochal revelation; somebody, perhaps, who will find that it is due to conditions of the kidneys or the liver or the ductless glands or the skin that certain families or individuals resist even massive infections, resist the infectivity of tuberculous houses and of tuberculous husbands and wives.—(*Bost. M. & S. Jour.*, Nov. 29, 1923.)

#### A "Short-Cut" to Better Health

Arthur E. Ewens, of Atlantic City, says: Allusion to a "short-cut" to better health is susceptible of two interpretations. It means an unerring "direct route" to the attainment of improved general health (as evidenced invariably by prompt increase in body-weight, etc.), and it also has reference to the most benign and restricted use of a pair of scissors in the proper performance of "EWENS' UVULECTOMY".

Before proceeding with this prophecy it might be well to again insert an emphatic reminder to the effect that two thousand, two hundred and seventy-seven (2,277) uvulae have been removed to date, that no malpractice suit has as yet been instituted against the originator of "uvulectomy", and that the occurrence of hemorrhage requiring control, or of any untoward complication or sequel, still remains in prospect,—although predicted by every physician and surgeon with whom the procedure has been discussed in person.

The following "prophecy of 1924" will later afford interesting and unique reading in the light of its early and startling fulfilment:

First of all,—a huge percentage of present-day nose and throat work is destined to be supplanted by "complete uvulectomy,"—and the sooner the better for the sake of the contributors to that enormous and lucrative field of medical practice. To be more explicit,—it may be said, without any fear of future contradiction, that absolute oblivion awaits tonsillectomy and the use of the various modifications of the Gottstein Curette. To a lesser extreme, perhaps, a similar fate is in store for turbinectomy, correction of congenital deviations of the nasal septum, puncture of the antrum and intra-nasal cauterization. Eustachian catheterization will likewise occupy a less conspicuous place in the practice of the "healing art", and there will be by no means the present demand for oft-repeated series of treatments directed to catarrhal involvement of the nares, post-nasal space, pharyngeal structures and the larynx.

The fallacious reasoning that places the blame for such a wide range of human ills upon those precious structures,—the tonsils,—reminds me of that phrase:—"In the Right Church, but the Wrong Pew." The source of trouble is most assuredly in the throat (and nose, and sinuses), but the poor, faithful tonsils are no more responsible for the

pathological sequence than are two overflowing buckets, catching rain-drops from a leaky roof, for damage to floor and ceiling below. As a matter of fact, tonsils perform a function identical with that of the overtaxed buckets, and what promptly happens to pus-laden tonsils after "complete uvulectomy" is analogous to what occurs within the water-filled buckets after proper repairs to the damaged roof. To complete the scope of this paper's prediction, review the vast array of pathological defects that science has linked with "diseased tonsils", and in later years recall this unbelievable; but well-founded prophecy that, when "Complete Uvulectomy" is so universally practiced that no human-being over two years old shall possess a *useless and menacing uvula*, the incidence of all the diseases in the category above suggested will be materially lessened, and the difference in their prevalence will provide the statistician with some very interesting material,—*comparisons that will be most astounding.*

Lest it be thought that the sponsor for this bold and succinct declaration is unmindful of the ridiculous light in which it places him before his incredulous opponents the world over, perhaps it would be well to append a reminder that the agitation already produced by such revolutionary utterances has afforded an intimate acquaintance with all of the indignities against which pride furiously rebels. To be the sole exponent of a radical doctrine does not constitute an enviable position, for in this instance all that our antecedents have so "nobly" accorded the pioneer in every field of endeavor has been visited upon the writer, with two exceptions only, viz.—corporal suffering and financial ruin. He has not escaped, however, an earnest and importune promise of the latter from his nearest associate in the practice of medicine.—(*Practical Med. & Surg.*, April, 1924.)

#### Anaphylaxis and Anaphylatoxins

Dale and Kellaway give two main theories which explain anaphylaxis: (1) The theory of cellular antibody, and (2) that of anaphylatoxin. New evidence is produced in favor of 1. A purified concentrated precipitin egg albumin was prepared, and a control preparation was made of similarly concentrated globulin from normal rabbit serum. Guinea pigs were rendered passively anaphylactic to egg albumine by an injection two days previously of the precipitin. Intravenous injection of further dose of the same precipitin, given a few minutes before a dose of egg albumin suppressed the anaphylactic reaction completely; normal rabbit globulin showed no trace of such protective action. Similarly isolated plain muscle from anaphylactic guinea pigs suspended in saline solution was completely protected from the stimulating effect of egg albumin by adding to the bath the precipitin which caused the anaphylactic conditions; normal globulin had no protective action.

The nature of so-called "anaphylatoxins," produced by digesting serum with carbohydrate solutions, etc., has been examined. Evidence is produced that their toxicity is due, not to protein cleavage but to formation of complexes which keep the foreign colloid finely dispersed in the finished product. The anaphylatoxins produce symptoms which are not identical with those of true anaphylactic shock, and they do not act on isolated plain muscle, as the anaphylactic antigen does, but only exhibit their action in the presence of the circulating blood. Their action is attributed to exposure of the blood to a large foreign surface. One dose of anaphylatoxin renders an animal insensitive to another, but leaves it, if anaphylactic, sensitive to the antigen.—(*Trans. Royal Soc.*, London, 273, 1922.)

#### The Treatment of Malaria

An opportune and valuable monograph recently published deals with many pressing points in the treatment of malaria in the following order: (1) The value of cinchona febrifuge; (2) the relative merits of the different alkaloids of cinchona in malaria; (3) the value of some tasteless preparations of quinin; (4), (5) and (6) intramuscular, intravenous and rectal injections of quinin; (7) the dosage of quinin; (8) the examination of the urine during quinin treatment; (9) quinin resistance.

Cinchona febrifuge is as efficient, therapeutically as is quinine in malaria, but it is much cheaper; there are many preparations of different strengths being sold under this name. The constitution of this drug should be legally defined; that made by the Government of India contains 54.65 per cent. of the crystallisable alkaloids quinine, quinidin, cinchonidine.

Contrary to the views of action, Dr. Fletcher finds that these four crystallisable alkaloids appear to be of equal value in bringing about the disappearance of malarial parasites in doses of 10 grains given twice daily, at which strength none of them produces toxic symptoms. The alkaloid quinidin is much more toxic and fails to destroy malaria parasites. Dr. Fletcher has